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Title:
Thoracic Society of Australia and New Zealand (TSANZ) Guidance for the Management of Electronic Cigarette Use (Vaping) in Adolescents and Adults

Date:
2025-07-01

Citation:
Marshall, H., Vandeleur, M., Dean, E., Barton, C., Luxton, N., Carson-Chahhoud, K., Schultz, A., Williams, J., Grammatopoulos, T., Stone, E., Shah, S., Jones, S., McDonald, C. F. & Peters, M. (2025). Thoracic Society of Australia and New Zealand (TSANZ) Guidance for the Management of Electronic Cigarette Use (Vaping) in Adolescents and Adults. Respirology, 30 (7), pp.605-622. https://doi.org/10.1111/resp.70066.

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Thoracic Society of Australia and New Zealand (TSANZ) Guidance for the Management of Electronic Cigarette Use (Vaping) in Adolescents and Adults

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Received: 2 October 2024 | **Revised:** 27 March 2025 | **Accepted:** 7 May 2025

Handling Editor: Paul Reynolds

Funding: The authors received no specific funding for this work.

Keywords: adolescent health | clinical respiratory medicine | electronic cigarettes | nicotine | paediatric lung disease | paediatrics | tobacco | vaping

ABSTRACT

Electronic cigarette (EC) use, especially among younger members of society, has grown to concerning levels in many countries, including Australia and New Zealand. Uptake in the general population, driven by technological and pharmacological innovations, and accelerated by aggressive tobacco/vaping industry marketing, has outpaced medical research. As the harms of EC use become increasingly evident, the Australian Government has introduced policies to curb recreational EC use, whilst still allowing access for smoking cessation. This highly dynamic environment presents new challenges to clinicians as the evidence to support clinical practice with respect to vaping use and its cessation remains very limited. This guidance document from the Thoracic Society of Australia and New Zealand aims to address this unmet need by offering practical advice for clinicians to help protect their patients' lung and general health by: preventing EC uptake in children, adolescents, and young adults; providing guidance for ceasing EC use in adolescents and adults who have never smoked; and providing guidance for ceasing EC use in people who currently or formerly smoked who now use EC long-term. Underpinned by a systematic review, this multidisciplinary expert consensus document summarises the current landscape of EC use, nicotine addiction, behavioural and pharmacotherapy treatments. Illustrative case vignettes are provided. The advice, largely extrapolated from the smoking cessation literature, is

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based on the consensus of the authors in the absence of high-quality randomised trials for vaping cessation and is applicable to all age groups. We emphasise the urgent unmet need for vaping-specific cessation research to inform future practice.

1 | Introduction and Background

1.1 | Statement of Purpose for This Document

The mission of the Thoracic Society of Australia and New Zealand (TSANZ) is to prevent, cure, and relieve disability from lung disease. We work to achieve a tobacco-free society and effective regulation of novel nicotine delivery systems. TSANZ actively collaborates with other national and international organisations with the aligned purpose of improving lung health in our communities.

Electronic cigarette (EC) use is harmful. Since the publication of the TSANZ Position Statement on Electronic Cigarettes in 2020 [1], the evidence of harm from EC use has continued to accumulate, and is discussed later in this paper. Nonetheless, given the importance and known benefits of smoking cessation, TSANZ accepts the recommendation for selective use of EC in smoking cessation attempts within the guidance outlined by the RACGP [2]. The TSANZ position may change as knowledge accrues.

At the same time, the pervasive use of EC for purposes other than smoking cessation is of great concern. There is widespread use in young people who have never smoked [3–5] but, just as concerningly, also in persons who have ceased smoking for a long period but remain long-term EC users in a perpetuated pattern of nicotine dependence.

EC use has proliferated rapidly in Australia and New Zealand. In 2023, an estimated 1.5 million Australians were current EC users, and 400,000 New Zealanders used EC daily [6, 7]. Only 21% of people reported using EC for smoking cessation, and only 13% of people obtained their EC through a prescription pathway [7]. It is likely that an even smaller proportion of EC use for smoking cessation was accompanied by personalised cessation support (counselling), a key element in cessation success.

The purpose of this document is to advise clinical practice in a rapidly changing environment. This advice aims to be practical and pragmatic and is framed to be compatible with the intent and details of public policy. The aims are to help clinicians protect their patients' lung and general health by:

1. preventing EC uptake in children, adolescents, and young adults;
2. providing guidance for ceasing EC use in adolescents and adults who have never smoked;
3. providing guidance for ceasing EC use in people who currently or formerly smoke(d) who now use EC long-term.

It is not possible to provide advice that will cover every clinical interaction, but we have developed scenarios that cover the most common and important situations.

This document does not seek to comprehensively describe all the harms of EC use; known harms have been reviewed by TSANZ and others [1, 8]. Nor does it seek to re-analyse the case for or against the use of EC for smoking cessation. We accept that this is appropriate in certain contexts and supported at the present time [2] therefore, our guidance is framed around this knowledge.

Building on a foundation of place of use restrictions and public information campaigns, Australia and New Zealand have made policy changes to address access to product supply and/or reduce product addictiveness with the intention to limit EC use to those people trying to quit smoking and protect the broader community from the harms of recreational use. The changes in Australia are detailed in Table 1. In summary, sale and supply of all ECs is now illegal unless supplied through a pharmacy. From October 2024, the maximum nicotine concentration for non-prescribed EC will be 20 mg/mL (2%), as per the EU, Canada and UK [11], and will only be available to people aged 18 years and over. However, if prescribed, EC nicotine concentration is allowed up to 100 mg/mL until July 2025, at which point the maximum strength will be reduced to 50 mg/mL. People younger than 18 will also require a prescription. ECs for sale at pharmacies will be subject to plain packaging requirements, and flavours will be limited to mint, menthol or tobacco. In New Zealand, nicotine ECs are available in retail stores and are not prescription based. New Zealand limits nicotine content to 20 mg/mL, or 28.5 mg/mL if the product is in salt form, and now requires a removable battery and child safety mechanism for all new disposable ECs. New Zealand has placed some restrictions on flavour names but not flavours themselves [12]. Further legislative and regulatory changes are likely, and clinicians should keep abreast of changes as publicised on Government websites.

The emergence of widespread EC use, followed by the policy changes that aim to reduce access, challenges clinicians to play an effective complementary role at the individual patient level. Facilitating EC cessation is an extension of clinicians' current role in smoking cessation, which may be somewhat unfamiliar to healthcare workers who work with younger persons. To help patients effectively requires a new or refreshed understanding of nicotine addiction and the particular features of EC and e-liquids that have created the problem presently faced. The agreed role of ECs as an additional tool for smoking cessation in some patients can and should be preserved.

EC use spans a range of ages and physical and psychological health scenarios. Clinicians will require education as well as adaptability. This document seeks to provide education for clinicians as they gain competence, experience, and confidence in this evolving area. It will be updated as new evidence and potentially new policies emerge.

The document has three parts: (1) The background, which discusses tobacco control gains over the last 50 years, the rise of ECs, nicotine addiction, and the evidence base for cessation interventions; (2) A series of recommendations framed as clinical questions, which include where adolescents can turn for help, assessing nicotine dependence, counselling and pharmacological

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TABLE 1 | Timeline of recent and proposed legislative changes in Australia.

Regulatory reform	Timeline
Ban on importation of all disposable ECs. Patients cannot purchase disposable ECs online from overseas, even if they have a prescription	1 January 2024
Special Access Scheme C (SAS C) pathway—new option by which medical, and nurse practitioners can prescribe therapeutic ECs. Under this pathway practitioners no longer need to apply to the Therapeutic Goods Administration (TGA) for prior approval to prescribe therapeutic ECs	1 January 2024
Therapeutic Goods Order (TGO 110) amended to restrict flavours to mint, menthol and tobacco	1 March 2024
Closure of the Personal Importation Scheme (consumers cannot order ECs from overseas, even if they have a prescription). Overseas travellers may bring a small quantity of ECs into Australia for personal use	1 March 2024
Ban on importation of all other ECs (unless importers obtain import licence and permit from the Office of Drug Control)	1 March 2024
Therapeutic EC importers and manufacturers are required to notify the TGA about compliance with the relevant product standards (e.g., TGO 110) before importation to Australia or release for supply in Australia (unless goods are included on Australian Register of Therapeutic Goods (ARTG))	1 March 2024
Manufacture, supply and commercial possession of all disposable ECs and non-therapeutic ECs prohibited (Therapeutic Goods Act 1989 (Cth) amendment)	1 July 2024
Strengthened advertising framework bans advertising across all media platforms except where specifically authorised	1 July 2024
ECs for smoking cessation, or management of nicotine dependence (therapeutic ECs), continue to be available from a pharmacy if they meet the TGA 'pre-market notification' requirements. Patients need to speak to a medical or nurse practitioner to buy nicotine containing ECs or access zero-nicotine vapes. Until 30 September 2024, a prescription is required to purchase nicotine ECs.	1 July 2024
Therapeutic ECs with a nicotine concentration of 20 mg/mL or less will be available from Australian pharmacies to patients 18 years or over without a prescription where a pharmacist assesses this to be clinically appropriate. Patients under 18 years old will still require a prescription, subject to state and territory laws (some jurisdictions prohibit the supply of any EC to a person under 18 years of age). ECs with nicotine concentration greater than 20 mg/mL will still require a prescription.	From 1 October 2024

Source: [9, 10].

support, patient follow-up, the Ask Advise Help (AAH) model and the general approach to patients; (3) Some case vignettes which illustrate possible management approaches. The Appendices detail the systematic search strategy and results, the writing committee, and the references. This guidance focuses predominantly on younger people, as they represent the majority of EC users, but the advice is applicable to all age groups, unless otherwise specified.

1.2 | Background

Through most of the 1900s, massive investment in advertising normalised smoking and increased social acceptability [13]. By the 1940s, tobacco consumption was at an all-time high, when approximately three-quarters of Australian and New Zealand men smoked, and 25% of women smoked. The adverse health effects of smoking were clearly established in the 1950s, and from the 1970s onwards, public health measures in Australia and New Zealand were put in place to try and reduce tobacco consumption. These included public information campaigns, advertising bans, increased taxation, on-pack health warnings, and smokefree policies, among others.

Despite concerted efforts by the tobacco industry [14], these measures were successful and Australian and New Zealand national smoking prevalence fell to 12% by 2019. Importantly, many of these gains came from reducing the uptake of smoking among youth. In 2022, only 2%–3% of Australian and 3% of New Zealand Year 10 school children smoked [3, 15], compared to 20%–30% in the 1980s [3, 16]. For young Indigenous Australians (15–17 years) smoking rates remain higher but improved from 33% in 2002 to 13% in 2019 [17]. In New Zealand Māori Year 10 regular smoking rates fell from over 43% in 2000 to 6.3% by 2022 [15]. As it relates to adolescents and young adults, smoking is now de-normalised for most, and access to tobacco cigarettes is difficult.

The tobacco industry has continuously adapted to the declining tobacco market through the evolution of new and existing

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products such as flavour capsules, smokeless tobacco, heated tobacco products, oral nicotine, and, most notably, ECs. The tobacco industry first outlined the concept of the EC in 1969 [18]. Modern EC systems (synonyms: electronic nicotine delivery systems [ENDS], nicotine vaping products [NVPs], vapes) were first developed in 2003. EC technology maximises nicotine delivery, ease of use, cost, and appeal. The technological development, marketing, and rapidly rising prevalence of ECs mimic that of combustible tobacco in the last century.

Early EC products delivered lower nicotine levels than combustible cigarettes, as higher nicotine concentrations were harsh or unpleasant. Furthermore, entry-level devices were expensive (more than $100), and maintenance was complex. Later generations of ECs, such as pre-filled cartridges (pods) and disposable ECs, address these product limitations as they are self-contained, do not require refilling, and can be purchased for less than $10. Using nicotine salts, rather than freebase nicotine, in e-liquids allows much higher nicotine concentrations to be inhaled (> 2% [> 20 mg/mL] up to 5%–6% [50-60 mg/mL]), achieving blood nicotine levels equivalent to combustible cigarettes without the associated harshness and throat irritation. Delivered nicotine dose varies between people and devices, but as a rough guide, 20 combustible cigarettes deliver approximately 20 mg of nicotine. Therefore, a disposable EC which contains 2 mL of 5% nicotine e-liquid is equivalent to five packets of cigarettes (100 mg nicotine). Data from JUUL states that their 5% EC devices equate to 200 puffs, which is approximately 20 tobacco cigarettes [19].

Evocative product names, colourful designs and fruity/sweet flavours contribute to a positive sensory stimulus and disposable ECs are popular for these reasons, as well as their low price and convenience. Children and adolescents have had little difficulty in accessing ECs from online and brick-and-mortar retailers, as well as through peer networks [20, 21]. Newer designs of ECs are breath- rather than button-activated, easily rechargeable and very discreet, thus the opportunities for EC use greatly exceed the opportunities to use combustible cigarettes. These technological advances have been supported by large-scale marketing including positive promotion on social media [22], normalising the misperception that 'everyone vapes', whereas in reality most adolescents have never used an EC. Until 2019, EC use in Australia and New Zealand was low, with 1.2% and 3.5% of adults reporting daily EC use respectively, predominantly with 'cig-a-like' devices and modifiable tank style systems [23, 24]. Based on reported device seizures and surveys, there was minimal nicotine salt-based product use, contrasting with the situation in Canada and the US [25]. From 2020, coincident with a rise in the illegal import and sale of disposable EC devices, there has been a sharp increase in EC use among adolescents and young adults [7]. In Australia between 2018 and 2023, a capital city survey reported past 30-day EC use increased from approximately 5% in all age groups between 14 and 34 years to 14.5% for 14–17-year-olds, 19.8% for 18–24-year-olds and 17.4% for 25–34-year-olds. The increase was less marked in older age groups [26]. In Victoria, between 2018/19 and 2022, daily EC use increased from 0.9% to 2.4% for all adults. Daily/weekly use increased 2–3 fold in the 18–24, 25–29 and 30–39 age groups [27]. The National Drug Strategy Household Survey (NDSHS) 2022–2023 reported that 18–24 year olds were the group most likely to use ECs, usually out of curiosity [7]. In younger age groups, 30% of Australian high school students reported using an EC in 2022–2023. Reported use was higher in females than males, and in older (16–17 year old) compared to younger (12–15 year old) students [3]. In New Zealand, a similar increase in EC use was seen, particularly among adolescents and young adults. The NZ Health survey 2022–2023 found 15% of 15–17 year olds and 25% of 18–24 year olds used ECs [28], and the Youth19 and ASH Year 10 surveys (conducted in 2019 and 2022–23, respectively) found that 6%–10% of 13–18 year old students, and 10% of 14–15 year olds vaped daily, respectively [5, 15]. EC use among Indigenous youth is particularly concerning, with much greater uptake compared to non-Indigenous youth. In New Zealand 2015, daily vaping use was < 5% in all ethnic groups. By 2022, daily vaping rates had risen to 21.7% in Māori, 11.1% in Pacific, 7.6% in European and 2.3% in Asian ethic groups [15]. Australian data are more limited, but ever-use of EC was significantly higher in Aboriginal and Torres Strait Islander students than in non-Indigenous students in 2017 (21.6% vs. 13.5%; OR 1.79 $p < 0.001$) [29]. NDSHS data had previously shown that the majority of young people commenced vaping before they had smoked a cigarette [7]. Disposable ECs have become the most common EC device, especially in younger age groups [30]. Almost all disposable EC devices taken from high school students contain high concentrations of nicotine (average 40 mg/mL) [31].

1.3 | The Essential Elements of Nicotine Addiction

Nicotine is rapidly absorbed through the lungs into the arterial system, reaching the brain in high concentration within a few puffs of a combustible or electronic cigarette [32]. Nicotine binds avidly to nicotinic acetylcholine receptors (nAChR) in the brain, releasing dopamine. This causes a brief pleasure response. As nicotine levels start to fall, displeasure or anxiety can be experienced, which is relieved by the next nicotine exposure [33]. Regular nicotine exposure upregulates nAChR such that higher doses of nicotine are required to achieve an equivalent response. Addiction is a complex process, a large part of which is genetically determined through polymorphisms in receptor subtypes and metabolic pathways [34]. However, addiction transcends pure biology and involves socio-psychological and behavioural factors: the product must be accessible and priced at a level that is compatible with regular use. Use is contextual and reinforced by certain cues including associated rituals, social settings, and sensory stimuli (taste, smell and visual). Place of use restrictions are such that combustible cigarette use is necessarily intermittent in the course of any day. In contrast, EC devices, with large reservoirs of e-liquid, and long-lasting or rechargeable batteries, can be used discretely and frequently to the point of near continuous use or 'grazing'. EC research and development led to the discovery that nicotine presented as a salt (by addition of a weak acid to the EC liquid mixture) avoids the unpleasant and harsh throat sensations that accompany freebase (unprotonated) nicotine, as used in combustible cigarettes and early EC formulations. Nicotine salt formulations are rated significantly higher in appeal, sweetness, and smoothness, and lower for bitterness and harshness than free-base formulations. These effects are more pronounced among 'naïve' users (those who have never smoked

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combustible cigarettes) and can facilitate regular use because unpleasant sensations are a barrier to smoking and EC uptake. Nicotine salt formulations enable higher concentrations of nicotine to be tolerated and thus contribute to addictiveness [35]. Nicotine content and delivery greatly exceeds that of a standard cigarette pack and is substantially cheaper in any comparison. These factors combined may lead to greater nicotine exposure in association with other behavioural factors that promote addiction.

1.4 | Potential Harms of Electronic Cigarettes

ECs pose harm from the inhalation of e-liquid aerosols and risks of burn and explosive injury from the delivery devices themselves [36] as well as fatal poisoning from ingestion [37]. E-liquids contain nicotine, often in high concentrations, and a carrier solution composed of propylene glycol and vegetable glycerine, synthetic coolant agents, and flavouring chemicals [38–40]. This complex mixture undergoes thermal degradation during heating such that the final inhaled vapour contains toxins, volatile organic compounds, pro-inflammatory compounds, carcinogens, and fine particulate matter. Toxic metals are emitted from EC heating coils, with greater exposure likely from disposable devices as they are more prone to degradation. Whilst some of the constituents present in tobacco smoke are absent or greatly reduced in EC vapour, there are many compounds that are uniquely present in EC vapour but not in smoke [41–43].

Nicotine consumption negatively impacts adolescent brain development and leads to nicotine addiction; this adversely affects mental health, increasing the risk of learning problems, anxiety, mood disorders, suicidal thoughts, and sleep disturbance [44]. The interplay between EC use and anxiety/depression is likely bidirectional as is the case with nicotine exposure from combustible cigarettes [45, 46].

EC aerosols damage oral health through altering the oral microbiome and increasing the risk of caries [47]. Inflammation, immune suppression, and epithelial DNA damage of a type that is considered a prelude to malignancy are found in the oral and nasal mucosa of EC users, with some e-liquid constituents and flavours posing additional hazards [48].

Respiratory symptoms, including cough, wheeze, and shortness of breath, are more frequent in EC users. These symptoms may improve after cessation of EC. There is clear evidence that exposure to EC aerosols adversely affects the airway surface through pro-inflammatory changes, oxidative stress, impaired mucociliary clearance, epithelial cell damage, and decreased innate immunity [49]. Not enough time has elapsed since the widespread use of ECs to have accurately documented all long-term effects; for example, evidence is emerging from animal models and cellular research suggesting there may be an associated risk of cancer [50, 51].

Short term risks are clearer; EC or Vaping use Associated Lung Injury (EVALI) came to the fore as an outbreak in the USA in 2019 and resulted in a considerable number of deaths. The precise ingredient(s) causing acute lung injury is not known but there is evidence linking it to vitamin E acetate in many, but not all, cases [52]. Whilst cases of EVALI were mostly limited to a discrete period and geographic area, EVALI and other health conditions remain an ongoing concern. The inhalation of any substance carries risks, especially if the long-term safety profile has not been ascertained, and the inhalation of multiple such substances (as inhaled from ECs) introduces much higher risk.

It will take some time, possibly decades, for some of the predicted harms in relation to COPD and lung malignancy to manifest. Effects in asthma are seen more quickly. The inhalation of propylene glycol is associated with increased airway hyperreactivity [53]. Children with asthma who are exposed to secondhand EC aerosols have a 30% increased risk of asthma attacks; adolescents with asthma who regularly use ECs have increased respiratory symptoms, more severe asthma symptoms, and increased school absences [54].

Cardiovascular disease risk appears similar between ECs and combustible cigarettes, countering the 'harm reduction' argument often cited by the tobacco industry. Of particular concern, dual use (concurrent use of EC and combustible cigarettes) is associated with higher risk of cardiovascular, metabolic, lung and oral disease than exclusive cigarette use, and exclusive EC use carried higher risk across all disease groups than non-use [8].

Finally, EC use is associated with at least a three-fold increased likelihood of initiating cigarette smoking ('gateway effect') with its attendant effects on lifetime health and mortality, although the effect could be up to five-fold in Australians aged 12 to 17 years [55, 56].

1.5 | Electronic Cigarettes as Smoking Cessation Aids

A detailed discussion of ECs as an aid to quitting combustible cigarettes is beyond the scope of this document. International guidelines vary substantially in their recommendations (Tables S1 and S2). Australian and New Zealand organisations tend to suggest that the role of ECs in smoking cessation should be considered a *last alternative* for people who are unresponsive to first-line cessation aids (combination of counselling and approved pharmacotherapy) [57–61]. Generally, American and Canadian organisations do not recommend ECs as a smoking cessation device [62–64], whereas various UK organisations actively encourage and supply ECs to people who smoke and oppose regulations that would infringe EC accessibility for this purpose [65–67]. No ECs have been approved as a therapeutic good by the TGA, and ECs are not listed on the Pharmaceutical Benefits Scheme (PBS).

TSANZ does not believe that EC is a superior option to nicotine replacement therapy (NRT) other than for people who smoke who are motivated to quit but have not succeeded with first-line and approved pharmacotherapy, together with personalised support. TSANZ therefore supports the Australian Government's reforms which restrict the availability of ECs to selected people who smoke and who wish to use these in a genuine smoking cessation attempt. This should be for the shortest period possible and must be supported by behavioural interventions.

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1.6 | The Evidence Base for Helping Patients Quit Electronic Cigarettes

This guidance document is supported by a systematic search and rapid review of the literature (see Appendix S1 for details). Most published guidance about ECs focuses on health effects, regulation and use as a smoking cessation device (Tables S1 and S2). There is limited evidence to guide clinicians on effective methods to cease ECs. In Australia, a variety of organisations recommend behavioural interventions (ranging from brief advice through to multi-session behavioural intervention) with TGA-approved smoking cessation pharmacotherapies where clinically appropriate [68]. In this document, we use the umbrella term 'counselling' for a range of behavioural interventions.

Continued EC use is persistent in a minority of young people and adults for a variety of reasons. Patterns of use prior to cessation, motivation to quit, and EC cessation strategies employed have been poorly studied. Research into effective EC cessation interventions is therefore preliminary [69, 70]. Most evidence to date comes from small-scale, often statistically underpowered studies. However, these studies demonstrate promising results for the feasibility and acceptability of interventions including financial incentives, mobile applications, text messaging, NRT, varenicline, cytisine, and counselling [71–78].

Reflecting the lack of high-level evidence, this current guidance is based on expert consensus and clinical experience and draws heavily from the evidence base for helping people quit combustible cigarettes.

2 | Clinical Questions

2.1 | Where Do Adolescents Seek Help From to Quit Electronic Cigarettes?

Most young Australian EC users report a desire to quit EC and many have made attempts to quit [79]. To date there has been minimal research investigating the channels, methods and tools that adolescents use or seek to use for support with EC cessation. As with tobacco smoking cessation, unassisted or 'cold-turkey' quit attempts are reported to be one of the most common methods of cessation of vaping [80–82]. Adolescents have described self-managing their quit attempts with distraction techniques (including video games), limiting access to an EC (e.g., not buying, or giving away ECs) or avoiding contact with peers who use ECs [80]. Adolescents seek advice and support for quit attempts from friends [80–82]. This suggests that peer networks are a significant factor in the continuation and discontinuation of EC use.

NRT has not been reported as a prevalent EC cessation aid for adolescents. Additionally, the use of social media, Quitlines, and text-based cessation support to assist with quitting has also been shown to be minimal [80–82]. The lack of utilisation of professional cessation support by adolescents highlights the absence of quit support methods endorsed by governing bodies. This further suggests that resources and quit messaging must be effectively tailored and delivered to resonate with this demographic.

2.2 | Where Do Adults Seek Help From to Quit Electronic Cigarettes?

Minimal research has investigated the methods and tools adults seek to quit ECs. Unassisted quitting and weaning EC use (e.g., lower strength nicotine concentration or less frequent puffs) were most commonly used in one US survey, but adults also used pharmacotherapy (NRT, varenicline) and sought clinical advice [83]. Interest in using online/smartphone applications, with an additional option of a live cessation counsellor, or text messages to help quit ECs among adults was also found [84]. Further research on quitting vaping in adults and youth is urgently required. This should assess the context and setting of the intervention, as well as the intensity and frequency of behavioural support, and type, strength, and duration of pharmacotherapy and NRT.

2.3 | How Do I Assess a Patient (Adolescent and Adult) for Nicotine Dependence and/or Withdrawal?

As with tobacco smoking, EC use should be assessed by clinicians at every opportunity. The Ask, Advise, Help (AAH) model (see below), developed for smoking cessation, can be used by clinicians in their everyday interactions with patients. It is important to understand the context, intensity, and frequency of EC use. More intense and/or frequent use warrants assessment for nicotine dependence and/or withdrawal [85].

Nicotine dependence is characterised by a strong internal drive to use nicotine. Dependence manifests as impaired ability to control EC/tobacco cigarette use, prioritising EC/tobacco cigarette use over other activities, and persistent use despite harm or negative consequences [86]. People who are dependent on nicotine may experience a short time between waking up and using their EC, cravings, tolerance (requiring higher nicotine dose to achieve the same effect), and symptoms of withdrawal upon cessation or reduction of use.

Nicotine withdrawal encompasses affective and somatic symptoms [87] which may include depressed or dysphoric mood, insomnia, irritability, anger, anxiety, difficulty concentrating, restlessness, bradycardia, increased appetite, and cravings for nicotine. Withdrawal symptoms usually begin within 2 h of last exposure, peak within 24–48 h, and gradually decline over the next 7–14 days. However, they can linger for several weeks, depending on the severity of dependence.

Various measures to quantify nicotine exposure and dependence have been developed. In clinical practice, short, pragmatic measures are typically preferred. Quantification of nicotine exposure from EC use, which correlates with biochemical measures, can be estimated by asking how many days per month an individual uses ECs [88]. Another simple measure of exposure—particularly for individuals using devices where nicotine strength is known—is the frequency of EC cartridge replacement or refill [85].

Similarly, a single question on self-perceived level of dependence 'On a scale of 0-100%, how addicted to ECs are you?' has been

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validated against biochemical markers of nicotine exposure in (primarily white, male, older) adolescents [88]. 'How long after waking do you vape?' (time to first vape, TTFV), provides a more objective measure of dependency, analogous to 'time to first cigarette' (TTFC), which is the best single item indicator of nicotine dependence [89]. TTFV within 60 min indicates a high level of dependence. From the smoking cessation literature, people with evidence of dependence are more likely to have quit success when provided with counselling and pharmacological support in combination.

2.4 | What Behavioural Supports Can Help a Patient Quit Electronic Cigarettes?

Several well-designed clinical trials are currently underway exploring a range of behavioural interventions for EC cessation, but results and clinical translation are pending (Table S3). Many are focused on adolescents, but research is also needed on adults and those who both smoke and use ECs ('dual use'). The well-powered RCT of text message intervention, 'This is Quitting', for EC cessation in young adults demonstrated a 39% increase in 30-day abstinence but is only available in the US [90].

Counselling can help the patient to manage nicotine cravings, withdrawal symptoms and triggers, and prevent relapse. To be effective, counselling requires training and skill, and should ideally be provided by a qualified cessation professional (e.g., Quitline, psychologist, tobacco treatment specialist). Counselling combined with pharmacotherapy is likely to yield greater EC quit success. The most common behaviour change techniques used by cessation counsellors are motivational interviewing and cognitive behavioural therapy (CBT). Both require specific training, and therefore are used to varying degrees by clinicians, depending on their interests and backgrounds. Short courses and educational materials for CBT and motivational interviewing are available in Australia (e.g., RACGP CBT online course). Behavioural change techniques place the patient at the centre of the team, co-designing strategies with the individual to determine what is most feasible and acceptable. A non-exhaustive list of strategies that clinicians could discuss with patients is summarised in Table 2, but this is not a substitute for professional counselling.

Quitline is a free confidential telephone counselling service staffed by trained counsellors that is available in Australia and New Zealand. Quitline has counselling protocols to support people who want to quit ECs, including adolescents. Quitline can also provide information to people supporting others who use ECs and/or smoke, and clinicians. Quitline counsellors are professionals trained in EC cessation and use motivational interviewing and behaviour change techniques to help people plan, make, and sustain a quit attempt. Proactive referral to Quitline online by the clinician during the consultation is preferable to leaving it up to the patient to initiate contact (AU https://www.quitcentre.org.au/referral-form; NZ practice management system). A designated Quitline for Aboriginal and Torres Strait Islander communities is available for Aboriginal and Torres Strait Islander clients. Australian and New Zealand Quitlines offer online training for clinicians.

The Sydney Children's Hospital Network has developed free interactive e-learning resources for clinicians including 'KidsQuit: E-cigarette and Young People' that provides strategies for advising adolescents, parents and carers on vaping cessation. There are also tailored resources for young Aboriginal people and for young people with mental health concerns. Other resources include, for example, iCanQuit, Alcohol and Drug Foundation, Headspace, eheadspace support service in Australia. In New Zealand, the online resource 'Don't Get Sucked In' helps adolescents and young adults understand the dangers of vaping and provides guidance for health professionals who work with rangatahi (Māori 'younger generation').

2.5 | What Medicines Can Help?

This section briefly describes the medications used for smoking cessation, which, by extrapolation, can be used 'off label' for EC cessation (currently there are no TGA or MedSafe approved medications for EC cessation). This description is general; clinicians should refer to the RACGP national guidelines on smoking cessation for detailed discussion of pharmacotherapy [92] and further guidance on specific cohorts is provided below. There is limited high-level evidence to support the efficacy or choice of pharmacotherapy in helping people quit ECs. Therefore, most of the recommendations are extrapolated from the tobacco smoking cessation literature. However, this seems a reasonable starting point as the underlying principles of treating nicotine addiction are the same.

For NRT this means supplanting the high peak nicotine delivery from ECs (and subsequent dopamine release) with 'low and slow' nicotine delivery from a combination of transdermal and buccal delivery sources. This attenuates withdrawal symptoms and allows gradual down-regulation of nAChR. For the non-nicotine pharmacotherapies, varenicline achieves the same effect by acting as a partial agonist and antagonist of the nAChR, and bupropion inhibits dopamine and noradrenaline reuptake and attenuates the stimulant effects of nicotine. An additional consideration for EC users who formerly smoked combustible cigarettes is to guard against relapse to combustible cigarettes. Counselling can help with this.

The type of medication used for EC cessation depends on patient choice. The highest success rates for smoking cessation, supported by the highest level of evidence, are for either varenicline or combination NRT (i.e., a patch plus a faster-acting buccal product such as gum, lozenge, spray). NRT dose should be tailored to help attenuate withdrawal symptoms and reduce nicotine cravings, allowing time for the individual to develop and practise behavioural strategies and for the brain nAChR to down-regulate.

Most often, NRT is under-dosed, therefore 'checking in' with the patient after 1–2 weeks is important to ensure NRT dose is correct. See Figure 1 for a suggested treatment algorithm for adults and adolescents. Varenicline and NRT patches/lozenges can be combined, but combinations are not PBS subsidised [93, 94]. In all cases, the behavioural and social aspects of nicotine addiction should be addressed through counselling provided by, for example, Quitline, or a psychologist or tobacco treatment

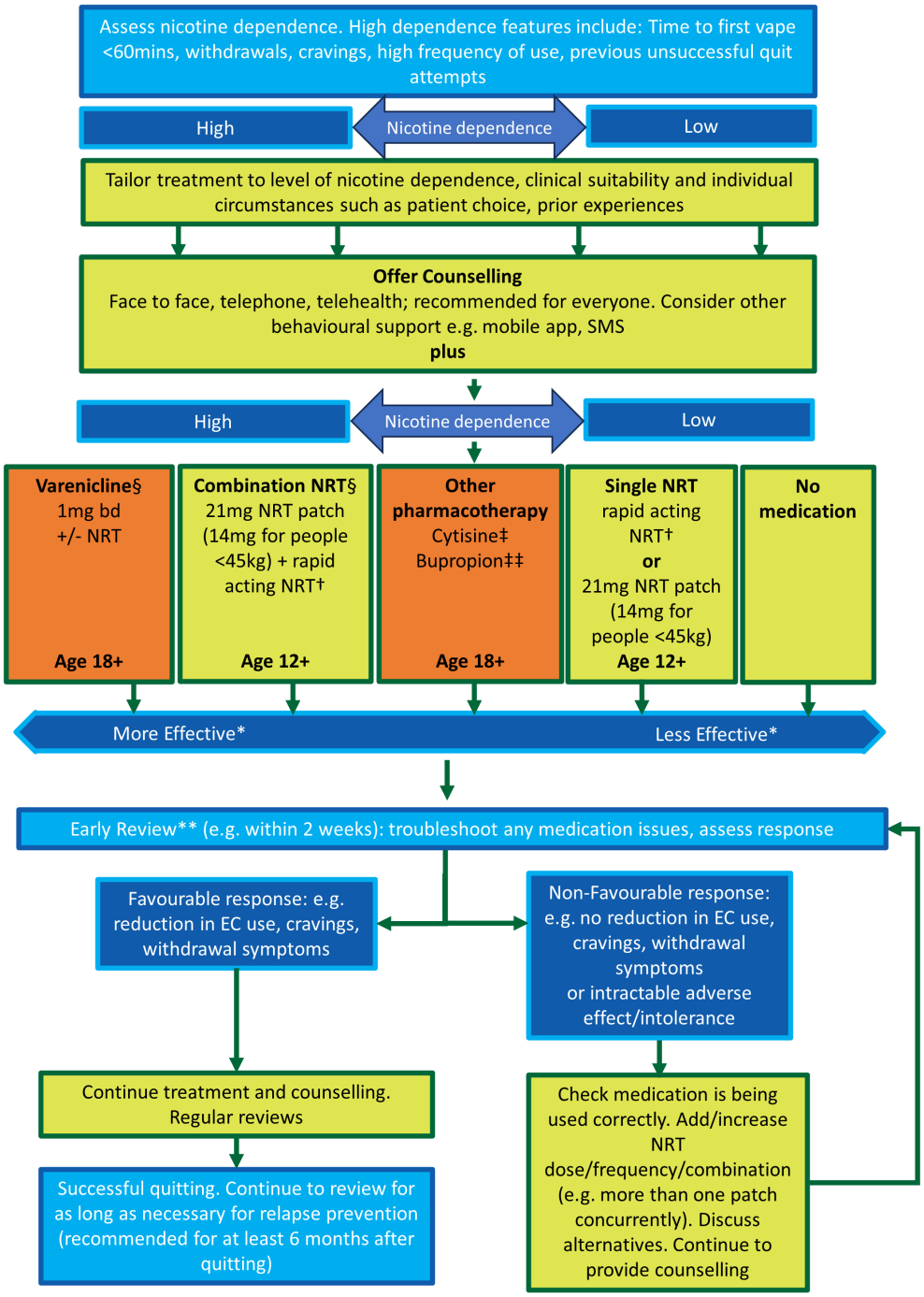
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TABLE 2 | Behavioural strategies to support the patients to achieve their goal.

Behavioural strategies to support the patients to achieve their goal	
Strategy 1: Alternative dopamine reward	This strategy is based on the dopamine release as the reward. Dopamine is a 'feel-good' chemical released in the brain. Research has shown that nicotine increases the level of dopamine in the brain. **Suggest**: Instead of using an EC, the person should carry a snack with them (nuts, flavoured sugar free gum) or do some quick exercise for a dopamine release.
Strategy 2: Think of yourself as someone who does not use e-cigarettes	This strategy is based on motivational interviewing so the person can imagine themselves as someone who does not use ECs. To exercise this strategy, the person can say to themselves: 'I am not a vaper' 'I don't vape/smoke' This can include asking the person to imagine an example of being offered an EC and role playing what their response would be. **Example scenario 1**: Imagine your friend/a group of friends, have asked you to go for a vape/take a hit of a vape. What is your response? 'I don't vape' 'I don't want a hit'. **Example scenario 2**: Role play a scenario offering an EC to the person. Think of other relevant scenarios with the person so they can continue practising this strategy.
Strategy 3: Use the 'stray cat' metaphor	This strategy uses the metaphor that the craving is like a stray cat. If you feed the cat, it will keep coming back. If you don't feed it, the cat will eventually go away. **Practise**: Ask the person to mindfully rehearse the metaphor when they have no cravings. Use the image of the cat when the craving begins.
Strategy 4: Distraction	Suggest the person distract themselves by doing something else e.g., go for a walk, play a video game, look at Instagram/Snapchat (if all dealers/vape material has been deleted or blocked), listen to music. **Advanced technique**: Distraction with imagery. When experiencing a craving the person learns to visualise something completely different like being on a beach, or cows grazing in a paddock. If stuck, it may help for them to focus on an aversive image e.g., vomiting. **Practise**: Mindfully rehearse a simple distracting visualisation when there is no craving.
Strategy 5: Rewards or incentives (contingency management)	Suggest the person set measurable goals to reduce or cease their EC use including positive reinforcement (rewards or incentives) for periods of abstinence. **Example scenario 1**: Involve a parent/relative/caregiver who agrees to provide a reward to the person for not using ECs for 1 week (or other agreed time). **Example scenario 2**: Support the person to identify a reward they can give themselves for an agreed period of abstinence.
Strategy 6: Make a promise (either committing to one or more of the above behavioural strategies, or to not using e-cigarettes)	Studies have shown that when people make a promise to do something they are more likely to comply. **Example 1**: Ask the person to make a promise to commit to doing one or more of the behavioural strategies in this guide. This can also be used in a situation where the health professional/worker asks the person to make a promise to not use ECs at specific times or for a number of days. **Example 2**: Do you promise me that you won't use ECs (vape) during school/work hours? The person may agree with a handshake (if appropriate).

Note: Adapted from [91] with permission.

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§ best efficacy data; equivalent effectiveness for combustible cigarettes
*based on data from smoking cessation
† rapid acting formulation NRT e.g. gum, lozenge, spray. Encourage liberal use. View Quitline videos on how to use.
‡ 3mg tds (Rigotti 2024)
‡‡ has equivalent effect to single agent NRT but has potential drug interactions
** does not necessarily need to be the same practitioner

FIGURE 1 | Management algorithm to help patients quit electronic cigarettes.

specialist. Combining counselling with pharmacotherapy results in the greatest chance of quitting ECs.

The Australian and New Zealand Governments subsidise smoking cessation medications through the PBS and Pharmaceutical Management Agency (PHARMAC) respectively. Subsidies and availability vary from time to time, and prescribers should check the PBS and PHARMAC websites for current information. At present in Australia, available medications include NRT patches (various strengths, up to 6 months course per 12-month period), varenicline tablets (up to 24 weeks) and bupropion tablets (up to 9 weeks). NRT

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gum and lozenges were available on the PBS but were removed by the manufacturer. This situation may change in future. In New Zealand, NRT, varenicline, bupropion, and nortriptyline are available through the PHARMAC schedule.

In Australia, over the counter (OTC) NRT includes patches (various strengths), and faster-acting products: gum (2 and 4 mg strength), lozenge and mini-lozenge (2 and 4 mg strength), and mouth spray, which are absorbed through the buccal mucosa. OTC products are likely to be more expensive than ECs, and this should be discussed with the patient. Cytisine is a tablet medicine that belongs to the same class of medicine as varenicline. Cytisine received TGA approval for the treatment of smoking cessation in adults (pharmacist only) and vaping cessation (by prescription), as of 1 October 2024 [95]. Cytisine has moderate-certainty evidence supporting efficacy and tolerability in smoking cessation [96], and emerging evidence for helping people quit ECs [75].

Duration of treatment for EC cessation has not been established. One RCT of varenicline plus counselling vs. placebo plus counselling in people who had already reduced EC consumption showed 17% relapsed to EC once pharmacotherapy was completed at 3 months [76]. For NRT, as with quitting combustible cigarettes, it should be continued for as long as necessary, perhaps up to several months following quitting, until the patient has consolidated their behavioural strategies and feels confident that they have successfully quit.

Weaning EC nicotine dose as a method of quitting has been suggested as a possible pathway to quitting and is often used by patients [83], although not yet supported by trial evidence. Nicotine dependent individuals aim to titrate nicotine intake to maintain a comfortable level of blood nicotine and avoid the withdrawal syndrome. Thus reduction or tapering of EC liquid nicotine concentration could lead to compensatory changes in vaping topography [97] (e.g., deeper and/or more frequent puffs), as seen in people who smoke combustible cigarettes when they reduce the number of cigarettes per day. However, in two large studies that compared EC use with NRT for smoking cessation, the concentration of nicotine self-selected by participants declined over a period of 6 to 12 months [98, 99].

2.5.1 | Drug Interactions and Contraindications

Varenicline and NRT are highly specific for the nAChR, and no clinically meaningful drug interactions have been identified. The only absolute contraindication to either drug is prior hypersensitivity. Bupropion is an antidepressant and does have potential drug interactions and contraindications, which should be checked by the prescriber (e.g., history of epilepsy; use of monoamine oxidase inhibitors). It is important to try and distinguish potential adverse events (AEs) from nicotine withdrawal syndrome; for the former, the drug dose may need to be reduced or ceased; for the latter (more likely), the NRT dose may need to be increased. AEs for varenicline and cytisine are usually mild, with the most common being nausea; dose reduction may help. Varenicline is titrated over 7 days, gradually increasing the dose to enable tolerance. If AEs are prominent, the dose can be halved and may still be effective. NRT AEs are also mild and include dizziness. Skin redness from the NRT patch adhesive can be treated with a topical steroid. Bupropion AEs include insomnia, headache, and rarely, seizure.

2.5.2 | Pregnant or Breastfeeding Women

If possible, pregnant women should be encouraged to quit ECs using intensive counselling. If quit attempts are unsuccessful, faster-acting buccal forms of NRT should be considered. Varenicline, cytisine, and bupropion are not recommended due to limited efficacy and safety data.

2.5.3 | Adolescents

NRT for smoking cessation is approved for children aged 12 years and older. The efficacy of varenicline in this population has not been demonstrated, and it is therefore not recommended for use in patients under 18 years of age. The safety and efficacy of bupropion and cytisine in patients under 18 years of age have also not been established, and are therefore not recommended.

2.5.4 | People With Mental Health Conditions

Intensive cessation counselling and close follow-up are important in this patient population group. Varenicline, NRT and bupropion can be safely used in people with mental illness [92].

2.5.5 | Medication Dose Algorithms

A suggested algorithm for helping patients quit ECs is presented in Figure 1. It is based on expert opinion. The key principles are to assess the patient's level of nicotine dependence, discuss patient-centred treatment options, educate on correct use of NRT/pharmacotherapy and potential AEs, and refer for counselling. Follow-up should be planned in 1–2 weeks to troubleshoot issues, check on progress, and titrate or adjust dose if necessary.

2.6 | How Often Should I Follow Up With Someone Trying to Quit Electronic Cigarettes?

Nicotine addiction is a relapsing–remitting disease, and quitting success is significantly hampered by easy access to legal and illegal products. Following the principles of supporting people trying to quit combustible cigarettes, follow-up should be patient-centred and will depend on local resources. The aims of follow-up are to troubleshoot any issues with their chosen pharmacotherapy (e.g., AEs or under-dosing) and offer continuing behavioural support. This does not necessarily need to be done by the same practitioner (e.g., behavioural support for any age group could be delegated to Quitline). The frequency of follow-up will vary by patient and over time, but initial follow-up should be 1–2 weeks after prescription of pharmacotherapy and continue until 6 months after EC cessation has been achieved. Thereafter, at each new consultation, the patient should be

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asked whether they have managed to quit ECs/remained abstinent, and support should be offered as necessary.

2.7 | What Is the 'Ask, Advise, Help' Model (AAH)?

'Ask, Advise, Help' (AAH) is a simple, evidence-based model for brief smoking cessation advice, designed for use by clinicians as part of everyday care [100]. It is the preferred model for many organisations including NSW Health [91] and RACGP. The AAH model is most effective when embedded into routine care alongside clear workplace smokefree policies and guidelines, the provision of training and education, and the endorsement of senior staff members [101].

The AAH model consists of 3 steps (Figure 2):

Ask each patient about their tobacco and EC use, assess the level of dependence (e.g., TTFV, daily EC use, withdrawal symptoms) and record status.

Advise all patients who smoke and/or use EC of the benefits of quitting in a personalised way, and how this might be achieved.

Help by providing behavioural support (e.g., Quitline referral) and access to pharmacotherapy (prescription or OTC) and arrange follow-up in 1–2 weeks.

The AAH intervention flow-chart is detailed below:

2.8 | How Should I Approach Patients Who Use Electronic Cigarettes?

Patients may feel guilt or be fearful of judgement about their EC use. Experiencing guilt or shame is a powerful barrier to developing effective clinical relationships and seeking timely help in future encounters. Population groups that feel socially excluded are more likely to have low levels of interpersonal and institutional trust. Even the anticipation of stigma is negatively associated with levels of trust in clinicians, communication experience, and acceptance of advice to quit smoking [102]. Anticipated stigma can arise from internalised stigma and/or experiences of stigma, but also from fear of discrimination, stereotyping, and future judgement. Stigma may be inadvertently caused by public health measures to reduce the social acceptability of ECs. Similarly, people who smoke and use ECs to support tobacco cessation are likely to be impacted by past experiences of stigma in health care settings and may anticipate stigma in future encounters [103].

Evidence from the broader literature on stigma shows clinicians tend to spend less time in appointments and provide less health education to patients with stigmatised conditions. Unconscious or unintentional bias can result in people being treated differently or unfairly, and may compound stigma in health care settings [104].

EC cessation advice, like smoking cessation advice, can have a positive cumulative effect when presented well and at the right teachable moment. Feeling respected by clinicians, perceiving that problems have been taken seriously, and being listened to are important factors that help build patients' confidence and trust [102]. A sense of collaboration between clinician and patient helps build and maintain a trusting relationship. This can be achieved by partnering with patients, sharing power, and listening to them carefully.

Every health encounter with an adolescent is a valuable opportunity to review their EC use and smoking history as part of a broader psychosocial assessment. For most adolescents, a psychosocial history is at least as important as the physical exam. The HEEADSSS [105] psychosocial assessment framework aids engagement and can be tailored to the situation and developmental stage of the young person. HEEADSSS stands for **H**ome environment, **E**ducation and employment, **E**ating, peer-related **A**ctivities, **D**rugs, **S**exuality, **S**uicide/depression, and **S**afety from injury and violence. An adolescent consultation should include time with the adolescent and guardian/s together, as well

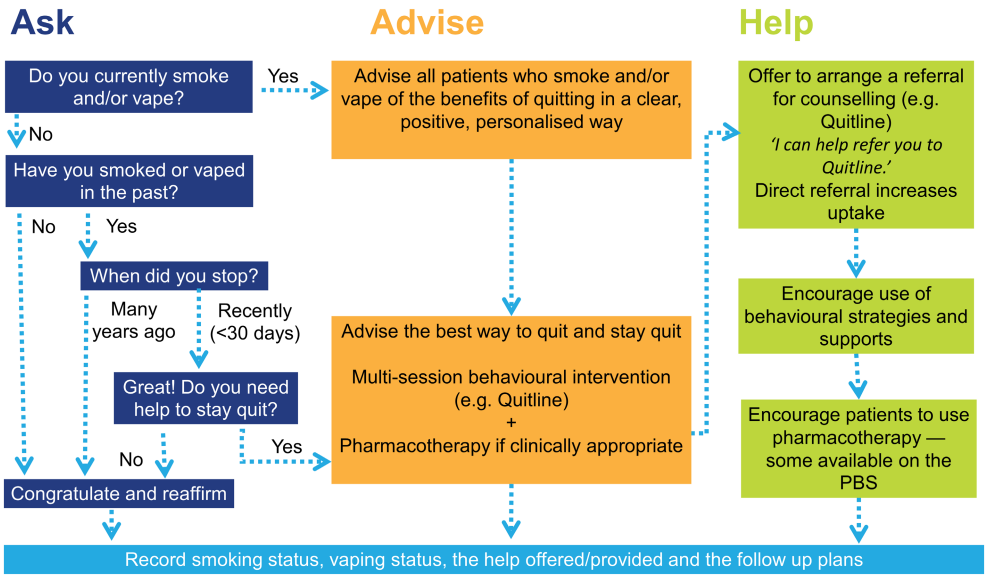


FIGURE 2 | Ask advise help model (*Source:* Adapted from General Practice |Quit Centre with permission).

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TABLE 3 | Clinical vignettes.

The following clinical vignettes illustrate common scenarios faced by health practitioners. They apply to all practitioners, whether situated in primary or secondary care. The principles, using the AAH framework and referring to Figure 1, can be applied whatever the patient's underlying health condition. Please adapt to your circumstances. Please note that these recommendations are based on expert consensus of the authors in the absence of high-quality randomised trials for vaping cessation.

Case 1	**Preventing uptake**: Non-smoking, non-vaping 16-year-old newly referred to adolescent severe asthma clinic having moved from interstate.
Ask	Asking and assessing smoking and EC use at every opportunity is important as these are dynamic behaviours. When built into the standard history taking, the questions can be framed very simply, such as 'do you currently smoke or vape?' or 'Have you smoked or vaped in the past?'. In some instances, a less direct approach might be effective e.g., 'do any of your friends vape?' followed by 'do you vape?'
Advise	This patient has never smoked or vaped. This is an important opportunity to provide positive affirmation that is tailored to the individual (e.g., '*that's great, it's really important that you avoid both smoking and vaping as they can really damage your health, especially as you have a lung condition*'). Reinforce preventive messages by looking to the future and asking how the person might respond if offered a vape (e.g., '*have you ever been offered a smoke or vape, ..., how did you deal with this?*', '*How would you handle a situation where a close friend offered you a vape in the future?*')
Help	Help by remembering to routinely enquire about smoking/vaping at successive clinics.
Case 2	**Young person at risk of escalation**: 14-year-old comes with their parent for advice on vaping cessation. They use a disposable EC once or twice a day, and more frequently on weekends (up to 6–8 occasions per day).
Ask	Ask if the adolescent can be seen on their own and discuss confidentiality (except when risk of harm to self or others is mentioned). Assess level of dependence (e.g., TTFV, frequency of use). Ask about reasons for vaping –what do they get out of it? Ask if they know the potential health risks and if they have considered quitting.
Advise	Advise that nicotine addiction is likely to increase over time and that the young person will likely escalate to frequent EC use. Discuss what life might look like if they were to quit. Explore the contexts of this occasional use and how they might be avoided. Discuss strategies for quitting. Ask if parents can be brought back in to provide non-judgemental support.
Help	Provide them with high quality education resources and links. Refer for counselling (e.g., Quitline referral) if appropriate. Arrange follow-up with yourself, regardless of current quit intentions.
Case 3	**Concerned family member**: 41-year-old woman attends for review of her lung condition. She states that her 15-year-old daughter is vaping. She asks what she can do to engage with her daughter on the issue.
Ask	Ask if anyone else in the house smokes or vapes; children often model the behaviour of adults around them. Ask if the mother has discussed the topic, if so—what went well, what did not. Ask mother if daughter is anxious, stressed or if there are any social drivers to vape. Try to gauge the level of daughter's dependence (e.g., TTFV, frequency of use).
Advise	Acknowledge the situation and be supportive. Affirm that it is important to quit vaping to protect health.
Help	Help by offering links to high quality education resources and links for the mother and the daughter e.g., https://www.vichealth.vic.gov.au/resources/resource-download/vaping-conversation-guide-parents. If appropriate, discuss referral to Quitline or counselling (via GP or self-referral). Help by continuing to enquire about progress at the mother's next visit.
Case 4	**Young person with highly dependent EC use**: 17-year-old comes with their parent for advice on vaping cessation. They have features of high dependence. They are motivated to stop but have relapsed after each of several attempts. They have considered OTC NRT. What should they do?
Ask	A full history is required to gauge level of nicotine dependence (e.g., TTFV, consumption, frequency, symptoms of withdrawals), prior experience of quit attempts (e.g., what did they do, how did it go, what did they learn from the experience), what are the perceived barriers, and what other social or environmental issues might be at play. Spend time with the young person without the parent present for confidential discussion.

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TABLE 3 | (Continued)

Advise	Discuss counselling and pharmacotherapy options, using the algorithm as a guide and tailored to the individual (including cost) and prior experience. For example, gum may be an issue in the school setting. If pharmacotherapy is chosen, it is important to provide enough information to enable correct and proper use and discuss common side-effects (consider using Quitline videos to help educate, e.g., NRT patches, gum, lozenge). Incorrect use of pharmacotherapy reduces effectiveness, which can lead to 'failure' of the quit attempt and undermine future motivation and self-efficacy.
Help	Prescribe chosen pharmacotherapy and provide patient education on proper use; proactively refer for counselling; arrange to see within 2 weeks if possible; provide a quit plan (e.g., Insight—Resources—Vape Check); ensure the quit plan is well communicated to other members of the healthcare team as well as the patient and their parent. Provide links to other high quality educational resources (e.g., NSW Health Vaping Hub; Qld Health).
Case 5	**Opportunistic enquiry**: 24-year-old woman attends her GP for oral contraceptive pill prescription, booked as a brief appointment. As a routine you ask about smoking. 'I don't smoke but I started vaping 2 years ago'. The patient has frequent vaping with features of dependence.
Ask	At present, vaping is more frequent than smoking in young adults. Therefore, smoking and vaping should be routinely asked about *together* (luckily, the patient volunteered this information). For example, ask '*do you currently smoke or vape?*' (See AAH diagram). Ask about device, flavour, intensity, duration, and frequency of use, cravings and withdrawal.
Advise	You may not have time to do a full assessment at this short appointment, but at a minimum, advise and educate the patient on the health risks, and benefits of quitting. If possible, use motivational interviewing techniques, advise the patient to quit vaping in a non-judgemental way, linked to the effect on their lung health, and discuss the best ways to quit.
Help	Suggest that the patient return for a specific discussion about vaping and arrange follow-up in the next few weeks. Provide educational materials and suggest that the patient can try to quit 'cold turkey' in the meantime if they wish. If the patient tries this, they may experience several days of withdrawal symptoms, but these will pass. Offer referral to Quitline.
Case 6	**Trying to quit smoking**: A 55-year-old man who currently smokes seeks advice about using EC to achieve smoking cessation. He has experienced early relapses after 'cold turkey' attempts, did not tolerate varenicline and feels dispirited after a failed quit attempt using patch only NRT. He is motivated to try EC.
Ask	Establish degree of nicotine addiction (CPD and TTFC); it is important to tease out reasons why varenicline was not tolerated, and details around NRT patch 'failure'. Ask if they received any counselling support?
Advise	Firstly, establish whether the prior cessation medicines were used appropriately to best effect (i.e., as per evidence base, and with support or counselling); advise that ECs are second line therapy. Use information gained from 'Ask' to discuss varenicline and combination NRT; ensure patient is educated on optimal use (e.g., titrate varenicline dose upwards over 7 days; can reduce to half dose if unacceptable gastrointestinal side-effects); advise that combination NRT (patch plus gum/lozenge/spray) is more effective than a single agent. All pharmacotherapy works best if delivered alongside counselling. Most 'failure' of medication is due to incorrect use and/or underdosing, or an over-estimation of the expected effect; these issues can be managed proactively with counselling. Advise that the use of EC is for cessation of nicotine use/dependence rather than complete or partial substitution—highlight the risk and additive harms of dual use smoking and vaping.
Help	If varenicline intolerance and NRT issues are not genuine, refer to the algorithm to discuss medication options. If varenicline intolerance and NRT issues are genuine, agree that use of EC in a cessation attempt is reasonable, though carries risks if used long-term. Manage expectations by stressing that there will be careful follow-up, that EC use will be short term and that there will be successive weaning of the nicotine concentration so that gentle withdrawal will be achieved. Prescribed pod systems are preferred. Because the patient is highly dependent, start at 18 mg/mL with a plan to wean to 13 mg, then 6 mg/mL depending on progress. There is potential to combine with NRT such as a patch. There is no evidence to support initial concentrations higher than 18 mg/mL and these should not be used. Reiterate the importance of eventual complete abstinence from smoking and vaping and the importance of avoiding dual use. Arrange follow-up in the next 2 weeks to assess progress, troubleshoot any issues, and dose-adjust where necessary. Follow-up can be done by yourself, in conjunction with or outsourced to another appropriately trained health practitioner or Quitline.

(Continues)

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TABLE 3 | (Continued)

Case 7	**Less motivated, dual use**: 48-year-old with current dual-use seeks advice. Previous 30 CPD smoking, but started vaping as increasingly inconvenienced by smoking restrictions. Currently smokes 15 CPD and 10–12 vaping sessions with high strength disposables bought from friends. High dependency.
Ask	Even though dependency is likely to be high, nicotine dependency should be quantified. Ask about patient's motivations and barriers to quitting, and any previous quit attempts.
Advise	Explore patient's knowledge/assumptions around harms. Advise strongly on harms of dual use. Tailor quitting benefits to medical history/symptoms if possible. Stress importance of combining counselling with cessation medications to maximise chance of success.
Help	Create a quit plan with the patient. The context of use for both EC and cigarettes is important and high-risk relapse situations should be avoided. Options could include a two-stage process, where cessation of smoking is tackled first, followed by cessation of vaping in a similar fashion to the previous case. Offer an EC prescription, to avoid continued use of 'black market' product and allow clearer dose titration. Alternatively, where the patient is keen to quit both at once, use the most effective pharmacotherapy support— varenicline + NRT gum/lozenge/spray. Counselling engagement is critically important. The patient will need regular and frequent follow-up; be prepared for the long haul. Stress that relapse is common and is not a signal of personal failure – rather it creates a rethink of why cessation was important and a stimulus for another attempt incorporating the lessons learned.
Case 8	**Using non-nicotine vape**: A patient who used to smoke tobacco cigarettes switched completely to EC and has successfully self-titrated nicotine content down with Quitline support. Patient now using nicotine-free vapes. They are troubled about the Quitline advice to stop nicotine-free EC.
Ask	Is the patient certain that the EC are nicotine free? (Recall misleading labelling as a response to previous TGA initiatives). Suggest that it is *unlikely* that the EC are nicotine-free (which would explain why they are still difficult to quit). Offer cotinine test (blood or urine). If positive, quit plan will need to change as the EC clearly contains nicotine (note, nicotine from any source – NRT, cigarettes and ECs—will be metabolised to cotinine).
Advise	Advise that there is no 'benefit' or safety of using non-nicotine EC as they still contain toxic chemicals including flavourings, and therefore cause harm. It is important that your healthcare advice is consistent with best practice, therefore support and endorse the good advice already given by Quitline.
Help	Help patients stop EC, even if truly nicotine free, by focussing on behavioural measures and motivational techniques. Encourage patient to continue to engage with Quitline.
Case 9	**Adult high intensity vape use**: 45-year-old patient who used to smoke cigarettes, is now using disposable nicotine salt vapes with 50 mg/mL concentration. Patient is self-employed and is not subject to workplace restrictions. Patient has multiple relaxed sit down and vape sessions (an estimate of 16 times per day) and at other times is just 'grazing'. The patient reports one failed vaping quit attempt (lasted 24 h, relapsed due to boredom and some cravings). The patient presents with the twin problems of high dose nicotine exposure and frequent contextual triggers for use. The patient is indifferent to EC cessation and expresses concern about withdrawal symptoms. The patient is not keen to use NRT or varenicline.
Ask	Ask if the patient is motivated to try another quit attempt. Suggest that the patient list the time and locations of their usual vaping. Ask whether it is possible for the patient to reconfigure their work and home environment to reduce cues to vape.
Advise	Advise the patient that they have features of high nicotine dependence, but that vaping cessation is achievable. Discuss a multi-stage process as follows: step 1- the patient switches from disposables to EC pods. Although this may be more expensive in the short term, it will enable down-titration of nicotine strength. Step 2—limit the opportunities (places and contexts) to vape. For example, remove all vapes from the bedroom to reduce the risk of overnight vaping; create multiple 'no vape' zones at home and work to reduce the likelihood of 'grazing'. The patient should identify key supporters to help them (family, work colleagues) and advise them to seek advice and support from Quitline.

(Continues)

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TABLE 3 | (Continued)

Help	Help patient to reduce the nicotine concentration with the change of EC pod rather than a disposable device. Whilst there is a lack of trial evidence to support use of concentrations greater than 20 mg/mL, in this clinical situation it may be reassuring for the patient to use a pod with 30–35 mg/mL nicotine for several weeks before a further step down. This will require prescription. Once the pattern of vaping has been stabilised at a concentration of 30 mg/mL it should be possible to follow the scenario in Case 6: wean to 18 mg/mL, then to 13 mg/mL, then to 6 mg/mL depending on progress. There is potential to combine with NRT such as a patch. Reiterate the importance of eventual complete abstinence from smoking and vaping and the importance of avoiding dual use. Arrange follow-up in the next 2 weeks to assess progress, trouble shoot any issues, and dose-adjust where necessary. Arrange on-going follow-up appointments at each visit as appropriate. Follow-up can be done by yourself, in conjunction with or outsourced to, another appropriately trained health practitioner or Quitline.

Abbreviations: AAH, ask-advise-help; CPD, cigarettes per day; EC, electronic cigarette; OTC NRT, over the counter nicotine replacement therapy (non-prescribed); TGA, The Therapeutic Goods Administration; TTFC/TTFV, time to first cigarette or vape.

as dedicated time with the adolescent alone. Screening for EC use among adolescents should occur in a confidential manner to improve the likelihood of the adolescent being forthcoming in their responses. Confidentiality is an important pillar of treatment of adolescent substance use, and adolescents may prefer that their EC use remain confidential. If the adolescent does not think the parent is aware of their EC use, it is often helpful to encourage the adolescent to speak to their parents about their EC use and desire to quit. Should a young person report that they are not vaping (or smoking), clinicians should consider this opportunity to help prevent EC uptake and future use. For example, this may include:

- Congratulating and affirming healthy decision making.
- Exploring reasons for decisions (these may include concerns around health effects, addiction, cost and environmental pollution [106]).
- Preparing for potential future exposure (e.g., peer pressure, managing stress and anxiety).

The principles outlined in this document are illustrated as a series of nine clinical vignettes in Table 3.

2.9 | Conclusions

EC use has rapidly risen in Australia and New Zealand in recent years. The adverse health effects of ECs are well described and will become clearer over time. Clinicians have an important role in assisting their patients to quit both combustible and electronic cigarettes. Until the evidence matures, this document aims to provide practitioners with expert consensus guidance to assist their patients safely and effectively in this endeavour.

Acknowledgements

Many individual clinicians and others concerned with Public Health have responded to the surge in electronic cigarette use in Australia and New Zealand. The authors respect and wish to acknowledge these contributions. We reflect positively on many discussions and much information sharing with them on a range of platforms. We recognise that they have been directly or indirectly formative in the development of the opinions of the authors expressed in this Position Statement and are grateful for this. Open access publishing facilitated by The University of Queensland, as part of the Wiley - The University of Queensland agreement via the Council of Australian University Librarians.

Conflicts of Interest

In the past 36 months, the following authors report relationships/activities/interests related to the content of the manuscript: Payment or honoraria for lectures J.W., H.M. Support for attending meetings J.W., N.L. Grant funding: A.S., H.M., C.F.M. Leadership or fiduciary role in other boards, societies, committees: A.S. (President of the Australian Council on Smoking and Health); H.M. (TSANZ Tobacco SIG convenor, APSR Tobacco control committee, IASLC tobacco control committee), E.S. (IASLC tobacco control committee, Thoracic Oncology Group Australasia), E.D. (employee of Cancer Council Victoria), M.V. (TSANZ Tobacco SIG deputy convenor, Member National E-cigarette Monitoring and Evidence Consortium (NEMEC), Member ASA Clinical Committee, Member RACP ATC in Respiratory and Sleep Medicine), C.F.M. (Board Director Institute for Breathing and Sleep, Chair Lung Foundation Australia COPD Committee, Member COPDX Guidelines Committee, Lung Foundation Australia), M.P. (TSANZ Tobacco SIG, NHMRC Advisory Committee, Various Govt agency committees), N.L. (TSANZ Tobacco SIG, TSANZ Education and Training Subcommittee). Participation on a Data Safety Monitoring Board: C.F.M.

Data Availability Statement

Data sharing not applicable to this article as no datasets were generated or analysed during the current study.

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Supporting Information

Additional supporting information can be found online in the Supporting Information section.

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