Vania Modesto-Lowe, MD, MPH
Medical Director, Hartford Behavioral Health, Hartford, CT; Department of Psychiatry, University of Connecticut, Community Faculty, University of Connecticut, Farmington, CT

Lakshit Jain, MD
Department of Psychiatry, Assistant Clinical Professor, University of Connecticut, Farmington, CT; Connecticut Valley Hospital, Middletown, CT

Roberto León-Barriera, MD
Department of Psychiatry, Consultation Liaison Psychiatry Fellow, University of Pennsylvania-Perelman School of Medicine, Philadelphia, PA

Ignore e-cigarettes at your patient's peril

Cigarette smoking is the leading cause of preventable deaths, with more than 1 billion tobacco smokers worldwide.[1,2] This number has remained stagnant since 2007[1] despite extensive public health efforts and the availability of several smoking cessation medications.[1,2] Pharmacotherapies such as nicotine replacement therapy (NRT), varenicline, and bupropion in combination with behavioral therapies are helpful but do not work for all smokers.[3] In fact, long-term abstinence rates are modest for each attempt to quit.[3] Quitting is especially hard for smokers with high levels of nicotine dependence.[3] These subgroups are overrepresented by disadvantaged populations who carry a disproportionate burden of tobacco-related pathology.[1]

As a tool to decrease morbidity and mortality associated with smoking, several countries have endorsed electronic cigarettes (also known as e-cigarettes, vapes, vaporization devices, and electronic nicotine delivery systems) as a therapeutic tool to help refractory smokers to quit or to switch to a less harmful way of using nicotine.[4–10] These devices are used for the inhalation of vapor through a mouthpiece and may use disposable pods or cartridges or refillable tank systems.[4–10] They may be single-use or rechargeable and can be used with or without nicotine (or other drugs).[4–11] E-cigarettes produce an aerosol by heating a solution that usually contains nicotine and volatile organic compounds, and may also contain flavorings.[4–11]

Proponents of e-cigarettes view them as a harm-reduction strategy for refractory smokers.[4–11] Recent guidelines from the National Institute for Health and Clinical Excellence in the United Kingdom support the use of e-cigarettes for smoking cessation, and the country is considering them as medications.[4,12] In Australia, patients who failed conventional therapies may leave their doctor's office with an e-cigarette prescription.[5]

Last year, the US Food and Drug Administration (FDA) authorized marketing of the Vuse Solo electronic nicotine delivery system products,[6] owing to the premise that the products exposed trial participants to fewer harmful constituents compared with combustible cigarettes (eg, nitrosamine, benzene) by switching to use of these products only.[6] However, the FDA authorization is not considered approval for clinical use but rather for use as a consumer product. Similarly, the US Preventive Services Task Force found insufficient evidence to endorse e-cigarettes for smoking cessation.[2]

While US doctors remain wary of e-cigarettes and seldom discuss them with their patients,[2,5] their popularity remains high among smokers.[5] They mimic the hand-to-mouth movements of combustible cigarettes, have futuristic designs, and come in several attractive flavors.[7–10,13] In a systematic literature review, young e-cigarette users endorsed them as a safer option than combustible cigarettes and viewed them as an effective cessation aid.[13] As patients are already using these products, rather than dismissing use of e-cigarettes, we must provide accurate information to inquiring patients.

EVIDENCE

A meta-analysis of 38 studies found that the odds of quitting cigarettes were 28% lower in those who used e-cigarettes compared with controls.[7] They determined that e-cigarettes were associated with significantly less quitting among smokers.[7] However, a meta-analysis from Canada disputed these conclu-

doi:10.3949/ccjm.89a.22006

Downloaded from www.ccjm.org on May 7, 2025. For personal use only. All other uses require permission.

sions.[8] The Canadian investigators reported a positive relationship between e-cigarettes and smoking cessation for some smokers.[8] In an effort to reconcile these findings, a Cochrane review evaluated the effects of e-cigarettes to help smokers achieve long-term abstinence.[9] The analysis included 56 studies (N = 12,804), 29 of which were randomized controlled trials (RCTs). The researchers found evidence of moderate certainty that e-cigarettes with nicotine increase quit rates compared with e-cigarettes without nicotine and NRT for at least 6 months. The incidence of adverse effects was low across studies. Mild adverse effects were more common in persons randomized to nicotine e-cigarettes. These side effects included transient mouth and throat irritation, headache, cough, and nausea. However, the Cochrane review did not include the newest versions of e-cigarettes (eg, pod-based devices), which may have higher nicotine concentrations.[9]

E-cigarettes are rapidly evolving, and nicotine concentrations and additives continue to change. For example, the cartridges for one of the more popular pod devices (JUUL brand) come in 3% and 5% nicotine strength and produce higher blood concentrations of nicotine than earlier devices or combustible cigarettes.[14–16] This higher concentration of nicotine could potentially provide better relief from cravings, particularly in severely nicotine-dependent individuals. However, the higher concentration, speed of delivery, and more rapid absorption also increase the potential for addiction to the product.[16]

Overall, the evidence for e-cigarette use for smoking cessation appears mixed.[7] While RCTs indicate a positive effect of e-cigarettes on quit rates, observational studies did not.[7] Patients participating in RCTs often exhibit high levels of motivation to quit, whereas the general population shows varying levels of motivation. Altogether, this research suggests that e-cigarettes seem to work for smoking cessation under optimal conditions but not as well in naturalistic settings.[10] So, what should we tell our patients?

CLINICAL IMPLICATIONS

Smoking remains epidemiologically and clinically significant, particularly in vulnerable populations.[1–3] Clearly, the best advice for smokers is to abstain completely and use FDA-approved medications with behavioral therapies.[2] As clinicians, we need to ascertain the patient's readiness to quit and receptivity to standard therapies.[2] Unfortunately, such strategies may not be acceptable for all smokers. Refractory smokers may turn to e-cigarettes regardless of physician views.[5] They may use e-cigarettes to quit, to switch to what they consider to be a less harmful alternative, or to complement combustible cigarettes ("dual use").[13]

There is some evidence that e-cigarettes may help some smokers quit and may appear as a less harmful option for those who do not want to quit.[9,10] However, the patient needs to know that the FDA has not approved clinical use of e-cigarettes for smoking cessation, and that the newest e-cigarettes (eg, pod-based devices) have not been as extensively studied and often deliver higher nicotine concentrations, increasing the severity of dependence.[15] Similarly, dual use of combustible cigarettes and e-cigarettes is associated with higher cardiovascular risk than when either is used independently and thus is not advisable.[17,18] Currently, there are no data on long-term health effects of e-cigarettes.[4] Available research suggests that e-cigarette products appear less hazardous than the chemicals released by combustible cigarettes, but this is an evolving issue requiring further research.[4–11]

WHAT PHYSICIANS CAN DO

If a patient is already using e-cigarettes, it is up to the physician to discuss risks and benefits of these devices and provide options with better-established safety profiles of FDA-approved NRT modalities and pharmacotherapy[2] (**Figure 1**). Refusing to broach the subject leaves the patient vulnerable to e-cigarette marketing.[6,13] Clinicians should discuss the risks of dual use as well as the higher concentration of nicotine in pod devices and how it increases the potential for addiction.[16–18]

If the patient chooses to continue to use e-cigarettes, clinicians should advise the patient regarding the following:

- E-cigarettes are not licensed medications, and long-term risks are not known. However, they may appear to be less harmful than combustible cigarettes.[4] Do not engage in dual use, but rather switch completely to e-cigarettes.[4]
- Refillable devices are more likely to help patients quit, as they allow for gradual tapering of the nicotine concentration.[12,19]
- Vape shops may assist patients in identifying the appropriate nicotine concentration to start at based on what is available for each device and how much they smoke.[12,19] It is important that patients receive enough nicotine to overcome withdrawal symptoms.[12,19]

Downloaded from www.ccjm.org on May 7, 2025. For personal use only. All other uses require permission.

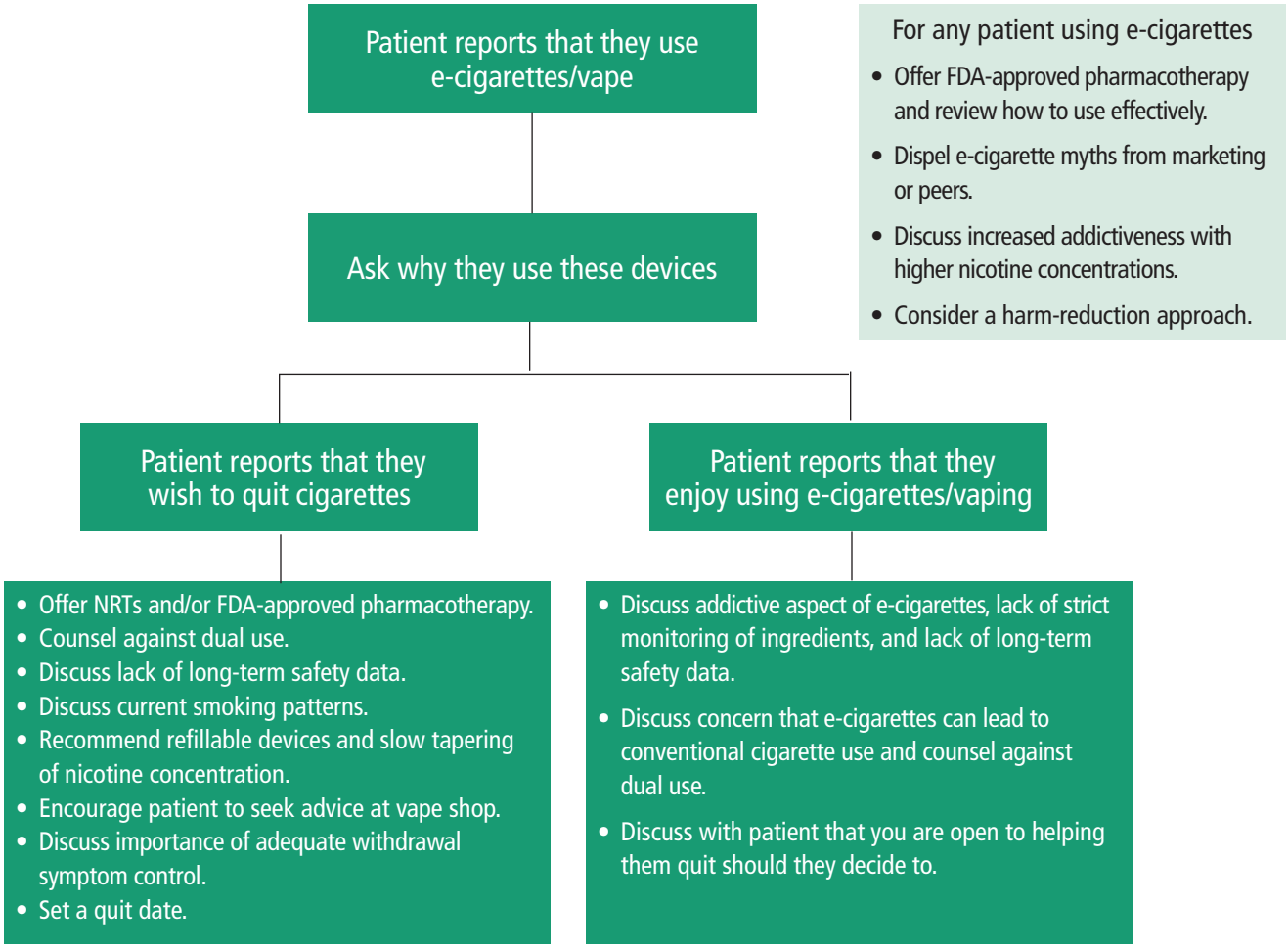

Figure 1. How to approach patients regarding e-cigarette use.

FDA = US Food and Drug Administration; NRT= nicotine replacement therapy

- Vape shops may also help patients identify the appropriate device for them.[12,19] It is also important to discuss patient goals. Do they want to replace cigarettes, decrease nicotine intake, or quit smoking altogether?[4]
- Finally, how long would the patient use the device if quitting is their goal?[4] It is important to note that initially there will likely be a trial-and-error phase until the patient finds a nicotine concentration that controls withdrawal symptoms.[12] Patients must use the device for long enough that they are able to quit combustible cigarettes completely.[4] Patients must be actively followed and progress assessed as they attempt to cut down. Clinicians should also continue to keep an eye for short- and long-term issues resulting from e-cigarette use.

As clinicians, we must provide education on the risks of e-cigarettes and dual use and help patients transition to less harmful options after failing other smoking cessation therapies. With a lack of clear evidence, conflicting public health guidelines, and predatory marketing from e-cigarette companies, it is our duty as clinicians to educate ourselves and help patients make the best choices for their health. ■

DISCLOSURES

The authors report no relevant financial relationships which, in the context of their contributions, could be perceived as a potential conflict of interest.

Downloaded from www.ccjm.org on May 7, 2025. For personal use only. All other uses require permission.

REFERENCES

1. **World Health Organization.** WHO report on the global tobacco epidemic 2021: addressing new and emerging products. https://www.who.int/teams/health-promotion/tobacco-control/global-tobacco-report-2021. Accessed November 10, 2022.
2. **US Preventive Services Task Force, Krist AH, Davidson KW, et al.** Interventions for tobacco smoking cessation in adults, including pregnant persons: US Preventive Services Task Force recommendation statement. JAMA 2021; 325(3):265–279. doi:10.1001/jama.2020.25019
3. **Modesto-Lowe V, Chmielewska A.** Coping with urges to smoke: what is a clinician to do? Conn Med 2013; 77(5):289–294. pmid:23777042
4. **National Institute for Health and Clinical Excellence.** Tobacco: preventing uptake, promoting quitting and treating dependence. NICE guideline [NG209]. Published: 30 November 2021. Last updated: 04 August 2022. https://www.nice.org.uk/guidance/ng209. Accessed November 10, 2022.
5. **Selamoglu M, Erbas B, Kasiviswanathan K, Barton C.** GP knowledge, attitudes, beliefs, and practices surrounding the prescription of e-cigarettes for smoking cessation: a protocol for a mixed-method systematic review. BJGP Open 2021; 5(6):BJGPO.2021.0091. doi:10.3399/BJGPO.2021.0091
6. **US Food and Drug Administration.** FDA permits marketing of e-cigarette products, marking first authorization of its kind by the agency. https://www.fda.gov/news-events/press-announcements/fda-permits-marketing-e-cigarette-products-marking-first-authorization-its-kind-agency. Accessed November 10, 2022.
7. **Kalkhoran S, Glantz SA.** E-cigarettes and smoking cessation in real-world and clinical settings: a systematic review and meta-analysis. Lancet Respir Med 2016; 4(2):116–128. doi:10.1016/S2213-2600(15)00521-4
8. **Malas M, van der Tempel J, Schwartz R, et al.** Electronic cigarettes for smoking cessation: a systematic review. Nicotine Tob Res 2016; 18(10):1926–1936. doi:10.1093/ntr/ntw119
9. **Hartmann-Boyce J, McRobbie H, Lindson N, et al.** Electronic cigarettes for smoking cessation. Cochrane Database Syst Rev 2021; 4(4):CD010216. doi:10.1002/14651858.CD010216.pub5
10. **Hajek P, Phillips-Waller A, Przulj D, et al.** E-cigarettes compared with nicotine replacement therapy within the UK Stop Smoking Services: the TEC RCT. Health Technol Assess 2019; 23(43):1–82. doi:10.3310/hta23430
11. **Centers for Disease Control and Prevention.** About electronic cigarettes (e-cigarettes). https://www.cdc.gov/tobacco/basic_information/e-cigarettes/about-e-cigarettes.html. Accessed November 10, 2022.
12. **National Center for Smoking Cessation and Training.** Electronic cigarettes: a briefing for stop smoking services. https://www.ncsct.co.uk/usr/pub/Electronic_cigarettes._A_briefing_for_stop_smoking_services.pdf. Accessed November 10, 2022.
13. **Ranjit A, McCutchan G, Brain K, Poole R.** "That's the whole thing about vaping, its custom tasty goodness": a meta-ethnography of young adults' perceptions and experiences of e-cigarette use. Subst Abuse Treat Prev Policy 2021; 16(1):85. doi:10.1186/s13011-021-00416-4
14. **What is the size of a JUULpod?.** JUUL. June 15, 2020. https://www.juul.com/resources/what-is-the-size-of-a-juulpod. Accessed November 10, 2022.
15. **National Cancer Institute.** Vaping pods produce high nicotine levels in young users. October 5, 2018. https://www.cancer.gov/news-events/cancer-currents-blog/2018/youth-vaping-high-nicotine-levels. Accessed November 10, 2022.
16. **National Academies of Sciences, Engineering, and Medicine; Health and Medicine Division; Board on Population Health and Public Health Practice.** Stratton K, Kwan LY, Eaton DL, et al, eds. Public health consequences of e-cigarettes. Washington, DC: The National Academies Press; 2018.
17. **Kim CY, Paek YJ, Seo HG, et al.** Dual use of electronic and conventional cigarettes is associated with higher cardiovascular risk factors in Korean men. Sci Rep 2020; 10(1):5612. doi:10.1038/s41598-020-62545-3
18. **Wang JB, Olgin JE, Nah G, et al.** Cigarette and e-cigarette dual use and risk of cardiopulmonary symptoms in the Health eHeart Study. PLoS One 2018; 13(7):e0198681. doi:10.1371/journal.pone.0198681
19. **National Health Service.** Using e-cigarettes to quit smoking. https://www.nhs.uk/live-well/quit-smoking/using-e-cigarettes-to-stop-smoking/#:~:text=A%20rechargeable%20e%2Dcigarette%20with,vape%20pen%20or%20pod%20system. Accessed November 10, 2022.

Address: *Vania Modesto-Lowe, MD, MPH, Department of Psychiatry, University of Connecticut, 263 Farmington Avenue, Farmington, CT 06030; modestolowe@uchc.edu*

Downloaded from www.ccjm.org on May 7, 2025. For personal use only. All other uses require permission.