Another Article About E-Cigarettes: Why Should I Care?
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Hardly a week goes by without publication of another new study discussing the harms and benefits of electronic cigarettes (e-cigarettes). In fact, a quick search of the Journal of the American Heart Association (JAHA) reveals over a half dozen articles published on the topic of e-cigarettes in just the past year or so. Why all the fuss?

E-cigarettes were first introduced into the marketplace in 2003 and were initially promoted as an aid to help smokers to stop smoking.1,2 Early versions of e-cigarettes came primarily from China and were sold online. Sales of e-cigarettes have grown exponentially over the past decade, and they have become the most popular quitting aid used by smokers in many countries, including the United States.3,4 No one disputes the enormous health risks posed by cigarette smoking, or the need to find better treatments to help smokers overcome addiction to cigarettes. In theory, a product that can deliver nicotine like a cigarette without the toxins found in smoke could be used instead of cigarettes would be a welcome invention.5–7 However, concerns have been raised about whether e-cigarettes are an effective cessation aid or if they would actually reduce successful quitting by adult smokers, whether they are safe to use, and if they may be a gateway into smoking for youth.8–10 Most recently the popularity of the Juul e-cigarette among high school and college students who have no intention of smoking has raised concerns about the risk of nicotine addiction in non-smokers and its long-term health effects.11

Two recent comprehensive reviews of the scientific evidence on e-cigarettes help to define the state of the science around e-cigarettes. Admittedly, the science is in a state of flux and evolving rapidly.1,2 The National Academy of Sciences, Engineering, and Medicine report on the public health consequences of e-cigarettes, and a new evidence review on e-cigarettes and heated tobacco products commissioned by Public Health England both come to similar conclusions.1,2 Both reports acknowledge that available evidence indicates that e-cigarette use is less risky than use of combustible tobacco cigarettes, that e-cigarettes may be helpful to smokers who are trying to stop smoking cigarettes, and that e-cigarettes should not be used by non-smokers, especially youth. However, both reports also state that e-cigarettes contain constituents that are not inert and are likely to have some negative health effects on their own. The reports also note the need for more research to better understand which patients might be most likely to benefit from e-cigarette use to support complete cessation, who should avoid using them, and what the overall population health benefits might ultimately be.

The article by Jaber et al12 in this issue of the Journal of the American Heart Association (JAHA) presents some useful and reassuring data on who is and isn’t using e-cigarettes from the 2013–2014 National Health and Examination Survey (NHANES). NHANES is a well-designed national survey of a representative sample of adults (n=5423) and adolescents (aged 13–17 years, n=895), all of whom were asked about their smoking and use of e-cigarettes within the past 5 days as a measure of current prevalence. The survey findings reveal that e-cigarettes were used primarily by adult current and former smokers (prevalence of 8.2% and 2.7%, respectively). Use by never smoking adults was rare, with a prevalence of only 0.4%. Importantly, given concerns raised about the use of e-cigarettes by teenagers, the study found that current use of e-cigarettes was low, with only 9 of 895 adolescents reporting use of an e-cigarette in the past 5 days. The low rate of use by adolescents found in NHANES deviates from other national surveys conducted at around the same time.13 The difference in reported use of e-cigarettes likely reflects differences in how current prevalence of e-cigarettes was measured across different surveys. In most of the national surveys assessing...
teenage e-cigarettes use, current use is broadly defined as any use in the past 30 days instead of the past 5 days as was done in NHANES. Studies have found that the vast majority of youth who report using an e-cigarette in the past 30 days did so on only 1 or 2 occasions, thus suggesting that the 5-day window for assessment used in NHANES might provide a more accurate picture of current use by adolescents. Another limitation of this report is that it includes data only through 2013 and does not reflect the recent suspected uptake of Juul e-cigarettes, which currently holds the largest market share and is extremely popular among youth. While data are lacking on the actual use of Juul by youth, there are anecdotal reports of daily and compulsive use of Juul by youth who have never been cigarette smokers which is concerning.

While data on cigarette smoking by adolescents are unfortunately omitted from the Jaber et al article, the data on adults from NHANES clearly shows that cigarette use was by far the most common type of tobacco product used, with an overall prevalence of 21% compared with 2.6% for e-cigarettes in 2013–2014. Dual use of cigarettes and

Table. Talking to Patients About E-Cigarettes

| Topic                                      | Talking Points                                                                                                                                                                                                 |
|--------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| What is the best way to stop smoking?      | • The most effective treatment for smoking addiction is behavioral counseling combined with FDA approved stop-smoking medications (ie, nicotine replacement therapies, varenicline, bupropion).   |
|                                            | • E-cigarettes have not been approved as a stop-smoking treatment by the FDA. However, smokers who are unable to stop smoking with approved FDA medications may benefit from use of e-cigarettes as a cessation aid, though evidence is limited. |
|                                            | • Because e-cigarettes delivery nicotine, they are likely to help reduce urges to smoke and ease withdrawal from cigarettes.                                                                                  |
| Are e-cigarettes safe?                     | • E-cigarettes are not risk free, but evidence suggests they expose users to much lower levels of toxins compared with use of combustible tobacco cigarettes.                                                 |
|                                            | • The most common side effects are irritation of the mouth and throat and dry cough.                                                                                                                       |
|                                            | • Long-term risks of e-cigarettes are unknown, and you should discontinue use after successful cessation of combustible tobacco cigarettes.                                                               |
|                                            | • Ingestion of nicotine liquids can be dangerous. Keep e-liquids in childproof containers and keep them out of the reach of children.                                                                       |
|                                            | • Protect e-cigarette devices from extreme temperatures by not leaving it in direct sunlight or in a vehicle during freezing temperatures.                                                                |
|                                            | • Avoid vape battery explosions by:                                                                                                                                                                         |
|                                            |  a) Using devices with safety features such as button locks, vent holes, and protection against overcharging;                                                                                              |
|                                            |  b) Keeping batteries in a case to prevent contact with metal objects (ie, coins, keys);                                                                                                                     |
|                                            |  c) Not charging the device with a phone or tablet charger;                                                                                                                                               |
|                                            |  d) Not charging the device unattended; and                                                                                                                                                              |
|                                            |  e) Replacing batteries if they get damaged or wet.                                                                                                                                                       |
| What type of e-cigarette should I use?     | • There are many different models of e-cigarettes with different levels of nicotine delivery and flavors.                                                                                                   |
|                                            | • More advanced models that deliver nicotine more efficiently seem to work best for those trying to quit smoking tobacco cigarettes.                                                                      |
|                                            | • Carefully read and understand the manufacturer’s recommendations for use and care of the e-cigarette. If the device did not come with instructions or you have further questions, contact the manufacturer. |
|                                            | • Go to the FDA’s website for updates on e-cigarettes and safety information [https://www.fda.gov/TobaccoProducts/Labeling/ProductsIngredientsComponents/ucm456610.htm](https://www.fda.gov/TobaccoProducts/Labeling/ProductsIngredientsComponents/ucm456610.htm). |
| How should I use the e-cigarette?          | • Daily e-cigarette use is generally more effective for quitting smoking than intermittent use.                                                                                                           |
|                                            | • It may take practice to learn to use the device to deliver the proper amount of nicotine to relieve the urge to smoke.                                                                                |
|                                            | • Stop use of combustible tobacco cigarettes as soon as possible and discontinue e-cigarettes when you are comfortable that you have quit cigarette smoking for good.                                         |
|                                            | • Avoid dual use of cigarettes and e-cigarettes if possible.                                                                                                                                           |
|                                            | • E-cigarettes may be used along with an FDA approved stop-smoking medication such as a nicotine patch or varenicline.                                                                                  |
| Where can I use an e-cigarette?            | • Many public places do not allow smoking or use of e-cigarettes indoors.                                                                                                                                |
|                                            | • While the risks from secondhand vape are lower than that from smoking, it is best to vape outdoors and not around others.                                                                               |
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E-cigarettes was common and was highlighted by the authors as a potential health concern. However, data presented in the article show that the amount of dual use for cigarettes and e-cigarettes was about the same as it was for cigarettes and nicotine replacement therapies (ie, nicotine gum, patch, and lozenge). In other words, it is hard to interpret if dual use as described in the article represents a more permanent, potentially dangerous pattern of use or simply a snapshot in time reflective of efforts being made by smokers to try to move away from cigarettes. Evidence from longitudinal studies suggests that use of e-cigarettes generally, and to a lesser extent dual use, represents a transitory phase as smokers try to move away from smoking and/or relapse back to smoking.15

Currently, conclusive evidence of a benefit of e-cigarettes for smoking cessation remains lacking, particularly as related to sustained long-term abstinence from smoking.1,2 Much of the difficulty in establishing a benefit for e-cigarettes has do with the scarcity of randomized control trials demonstrating a benefit for e-cigarettes as cessation aids, although the studies available do suggest a benefit.16,17 Data from observational studies appear to support a benefit of e-cigarettes for smoking cessation, but are more difficult to interpret because of selection biases, variations in the types of e-cigarettes used by smokers, and variability in the patterns of use of e-cigarettes (eg, daily versus less than daily).1-4,18 Carefully designed studies are needed to conclusively determine the efficacy of e-cigarettes for long term smoking cessation and to identify individuals most likely to benefit from e-cigarettes as a cessation aid and those products which are most effective.

The good news is public health concerns that were raised about e-cigarettes delaying adult smoking cessation and leading more teenagers into taking up smoking so far have not materialized. In fact, recent data show both adult and youth smoking prevalence rates in the United States have fallen sharply over the same period in which e-cigarettes have risen in popularity.19,20 Additionally, in August 2016 the Food and Drug Administration (FDA) was granted regulatory authority over e-cigarettes allowing the agency to implement product standards to mitigate harms and maximize potential public health benefits. A major FDA effort is underway now to restrict access of youth to e-cigarettes, such as Juul.

In the meantime, busy clinicians are still confronted with the difficult task of advising patients on the potential risks and benefits of e-cigarettes at a time when the evidence remains uncertain. The National Academy of Sciences, Engineering, and Medicine report noted that while scientific evidence is insufficient to allow reliable conclusions to be made about the long-term health risks and benefits of e-cigarettes, it expected that such risks likely would be reduced compared with use of combustible tobacco cigarettes, because toxicants present in cigarette smoke are absent or present at much lower concentrations in e-cigarette aerosols.1 Given uncertainties about e-cigarettes, clinicians should advise cigarette smokers seeking to stop smoking to use evidence-based, FDA-approved, safe, and effective smoking cessation pharmacotherapies as first-line treatments in preference to e-cigarettes. For those smokers and ex-smokers who are already using the e-cigarettes, clinicians need to be informed and prepared to answer questions on the potential harms and benefits and to advise patients about use. The Table provides some suggested talking points to use when discussing e-cigarettes with patients. However, it is important to recognize that these talking points represent our suggestions based upon current evidence since there are no agreed upon evidence-based guidelines to inform clinical practice on patient’s use of e-cigarettes at this time.

Disclosures

Dr Cummings has received funding from Pfizer to advise them on ways to improve the delivery of tobacco cessation interventions to patients in healthcare settings. Dr Benowitz serves on scientific advisory boards for Pfizer and Achieve Life Sciences, companies that market or are developing smoking cessation medications. Both Drs Cummings and Benowitz have received payments as expert witnesses in litigation against tobacco companies. Dr Morris has no relevant conflicts of interest to report.

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