

# Vaping: Are Its “Benefits” a Lot of Hot Air?



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I was sitting in a restaurant bar a few days ago when a huge puff of cherry-scented smoke engulfed the area. As a former firefighter, I immediately looked around to find the source. You guessed it: a group of young adults were “vaping” nearby. This method of smoking is accomplished with an electronic “cigarette.” A sensor inside the e-cigarette detects airflow and initiates a heating element that vaporizes a liquid solution containing propylene glycol (organic compound with the chemical formula  $C_3H_8O_2$ ), the flavoring of choice, and nicotine.<sup>1</sup>

I knew of this fad but didn’t give it much thought until recently, when I realized how pervasive it has become. Frankly, I have always thought, *At least they are not smoking cigarettes and inhaling all that benzene, carbon dioxide, and formaldehyde.*

We all know smoking cessation is valuable to the health of the population, but what do we know about the effects of vaping? For one thing, use of e-cigarettes (vapes) has increased considerably since they were first introduced (0.3% to 6.8% between 2007 and 2010). This is cause for concern, because while some research on e-cigarettes has emerged since their appearance, there are few definitive answers regarding their effect on human health.<sup>2</sup>

We also know that nicotine is addictive and toxic (in high doses), but we do not know the effects of propylene glycol, although it is generally recognized as “safe.”

Symptoms that may occur as a result of vaporized propylene glycol inhalation include throat and ocular irritation, cough, mild airway obstruction, throat and vocal cord inflammation, headache, and dizziness. In spite of this, since the manufacturers of e-cigarettes have not made any therapeutic claims about their products, the FDA initially did not regulate them.

With e-cigarettes appearing in vaping shops, gas stations, and convenience stores—alongside advertising copy that claims vaping can help smokers curtail their habit by inhaling “harmless water vapor”—what should we tell our patients? These advertisements tout vaping as the “lesser of two evils” when compared to cigarettes. How can you knock that logic when we know cigarette smoking causes one in five deaths in the US each year and is a leading risk factor for COPD?<sup>3</sup>

The conundrum, as I see it, is threefold. The first step is to determine if vaping is a significant alternative to smoking cessation. The second is to determine if any components of vaping (nicotine, propylene glycol, or combustion) are safe for humans. Lastly, we must establish how to regulate e-cigarettes, given scientific uncertainty as to their therapeutic effects.<sup>4</sup>

In 2013, Palazzolo did a literature review of 66 articles related to e-cigarettes and vaping. He found that, when compared to the effects of smoking, vaping could be a substitute for smoking and a conceivable means for smoking reduction.

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It was unclear, however, if vaping could reduce nicotine addiction. He reported that the effects of vaping on human health are questionable, due to the extreme scarcity of empiric research.<sup>5</sup>

Although there has been a paucity of research on this topic, a study by Goniewicz and colleagues reports on the toxicants emitted by tobacco cigarettes and e-cigarettes.<sup>6</sup> Their results indicate that e-cigarettes emit fewer toxicants than traditional tobacco cigarettes (formaldehyde, 0.20-5.61 µg and 1.6-52 µg, respectively; acetaldehyde, 0.11-1.36 µg and 52-140 µg).<sup>7</sup> Despite this evidence, more studies need to be done on the effects of propylene glycol inhalation to determine the safety of e-cigarettes.

Another concern has been the lack of an age restriction on e-cigarettes and their growing popularity among grade and high school students. E-cigarette use doubled among US middle and high school students from 2011 to 2012, resulting in an estimated 1.78 million students who have used e-cigarettes as of 2012. There is serious concern about the possible harmful impact of nicotine on adolescent brain development, as well as the risk for nicotine addiction.<sup>8</sup>

Amid these growing questions and concerns, the FDA issued a warning that e-cigarettes may be as bad as the real thing and has recommended against their use.<sup>9</sup> Just last month, the agency final-

ized a regulation on all tobacco products, including vaporizers, vape pens, hookah pens, e-cigs, and e-pipes. They will now regulate the manufacturing, import, packaging, labeling, and distribution of e-cigarettes to ensure that ingredients are assessed and determined to be safe for human use. FDA Commissioner Robert M. Califf, MD, said, “We must do our job under the Tobacco Control Act to reduce the harms caused by tobacco. That includes ensuring that consumers have the information they need to make informed decisions about tobacco use and making sure that new tobacco products for purchase come under comprehensive FDA review.”<sup>10,11</sup>

Well, is it just a bunch of smoke, or are the new regulations and health warnings about e-cigarettes long overdue? I would love to hear your experiences and additional advice for our colleagues and patients regarding the use of e-cigarettes and vaping. You can reach me at PAEditor@frontlinemedcom.com. **CR**

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