

Sparking the Discussion about Vaping and Anesthesia

To the Editor:

We believe the anesthesiology community should be concerned about vaping, which is becoming more prevalent in the United States. From 2017 to 2018, the prevalence of e-cigarette use, a form of vaping, nearly doubled to one in five high school students.¹ This increase appears to be a public health concern given new research that demonstrates an emerging association between vaping and a variety of acute interstitial lung diseases, which may be conceived of as a subset of the larger category of vaping-associated lung disease. Indeed, surveillance data from emergency departments in Wisconsin and Illinois show that the mean rate of visits associated with severe respiratory illness during the summer of 2019 was twice that in the summer of 2018.¹

Previous research on e-cigarette use indicates that nicotine-containing e-cigarettes can stimulate adrenal catecholamine release, which can make the cardiovascular effects of anesthetics less predictable.² It is also known that interstitial pneumonias that bear histopathologic similarities to some reported vaping-associated lung diseases, although not themselves associated with vaping, have resulted in increased morbidity and mortality in the perioperative setting.^{3,4} However, no data apparently exist regarding surgical outcomes for patients who chronically vape, or have vaped shortly before surgery, compared to those who do not vape.

Currently, little is known about the perioperative implications of vaping. The extent to which vaping is linked to clinically important perioperative outcomes is unknown. In addition to unknown outcomes, it is unclear whether anesthesiologists and surgeons routinely ask patients explicitly about vaping, whether patients who vape are routinely referred to smoking cessation programs, or if such programs are able to address vaping. Depending on these factors, smoking cessation programs may be an important facet of preoperative clinics for surgical patients who vape. Adding vape-specific data to the smoking section in electronic medical record systems could also be considered, and may potentially facilitate better patient care and research. Last,

the molecular effects of vaping on the lungs and airway are only partially understood. Initial *in vitro* research suggests that e-cigarette vapor can induce ion channel dysfunction in airway epithelial cells,⁵ but other vaping ingredients such as nicotine, tetrahydrocannabinol, cannabidiol, and butane hash oils may cause short- or long-term changes throughout the airway and lungs.

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Competing Interests

The authors declare no competing interests.

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References

1. Layden JE, Ghinai I, Pray I, Kimball A, Layer M, Tenforde M, Navon L, Hoots B, Salvatore PP, Elderbrook M, Haupt T, Kanne J, Patel MT, Saathoff-Huber L, King BA, Schier JG, Mikosz CA, Meiman J: Pulmonary illness related to e-cigarette use in Illinois and Wisconsin – Preliminary report. *N Engl J Med* 2019; doi:10.1056/NEJMoa1911614 [Epub ahead of print]
2. Roberts M, Davies M: Dangers of using e-cigarettes before anaesthesia. *BMJ* 2014; 348:g1310
3. Sisodia SM, Bendale K, Khan WA, Sanklecha V: Giant cell interstitial pneumonia: An unusual finding in a case of preoperative death. *Am J Forensic Med Pathol* 2013; 34:110–4
4. Kubota T, Miyata A: Postoperative respiratory failure caused by acute exacerbation of idiopathic interstitial pneumonia. *J Anesth* 2011; 25:422–5
5. Lin VY, Fain MD, Jackson PL, Berryhill TF, Wilson LS, Mazur M, Barnes SJ, Blalock JE, Raju SV, Rowe SM: Vaporized e-cigarette liquids induce ion transport dysfunction in airway epithelia. *Am J Respir Cell Mol Biol* 2019; 61:162–73

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