



News Articles, Smoking

E-cigarette studies bust safety myths

by Melissa Jenco, News Content Editor

Two new studies on e-cigarettes showed they contain cancer-causing chemicals and are associated with future cigarette smoking in teens.

University of California, San Francisco researchers who authored the studies raised concerns about the attractiveness of e-cigarettes to youths in light of the growing evidence they are unsafe.

E-cigarettes and toxic compounds

For the study "Adolescent Exposure to Toxic Volatile Organic Chemicals from E-Cigarettes" (Rubinstein ML, et al. *Pediatrics*. March 5, 2018, <https://doi.org/10.1542/peds.2017-3557>), researchers recruited teenagers in the San Francisco Bay area to complete a survey as well as saliva and urine tests looking for eight volatile organic compounds (VOCs). The study was comprised of 67 e-cigarette-only users, 16 users of both cigarettes and e-cigarettes and 20 age-matched controls who had not used e-cigarettes or nicotine.

Researchers found dual users had significantly higher levels of metabolites of five VOCs (benzene, ethylene oxide, acrylonitrile, acrolein and acrylamide) compared to e-cigarette-only users and controls.

In addition, e-cigarette-only users had 20% to 341% higher levels of metabolites of five VOCs compared to controls (acrylonitrile, acrolein, propylene oxide, acrylamide and crotonaldehyde). At least four of those are carcinogenic.

"The presence of harmful ingredients in e-cigarette vapor has been established; we can now say that these chemicals are found in the body of human adolescents who use these products," authors wrote.

Three of the five VOCs were just as high in e-cigarette-only users who used non-nicotine products as those using nicotine products.

"This is particularly important since many teens initiate e-cigarette use with nicotine-free products, in part because they feel that they are safer," authors wrote.

Teens also may be attracted to fruit flavored e-cigarettes, but users of those products had higher levels of acrylonitrile, which is carcinogenic, according to the study.

"While e-cigarette vapor may be less dangerous than combustible cigarettes, with lower overall exposure to VOC toxicants, our findings challenge the idea that e-cigarette vapor is safe," authors concluded.

E-cigarette links to cigarettes

Previous research has found teens who had never smoked were more likely to use cigarettes after using e-cigarettes. Authors of a new study set out to look at the impact of e-cigarettes on teens who already had experimented with cigarettes.

Using the Population Assessment of Tobacco and Health survey, researchers analyzed data on 1,295 adolescents who had smoked at least one cigarette puff but fewer than 100 cigarettes.

The team found those who had ever used e-cigarettes were significantly more likely than never users to have smoked at least 100 cigarettes at follow-up, have smoked during the past 30 days or both. Fully adjusted models showed e-cigarette use predicted both having smoked 100 or more cigarettes and having smoked in the



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past 30 days, but neither of those two alone, according to "Electronic Cigarette Use and Progression from Experimentation to Established Smoking" (Chaffee BW, et al. *Pediatrics*. March 5, 2018, <https://doi.org/10.1542/peds.2017-3594>).

"Suggested in these results is that e-cigarette use is more likely to encourage youth smoking than to divert youth from smoking when considering individuals who have already experimented with cigarette use," authors wrote.

Resources

- [AAP Julius B. Richmond Center of Excellence e-cigarette website](#)
- [AAP policy "Electronic Nicotine Delivery Systems"](#)
- [Information for parents from HealthyChildren.org about e-cigarettes](#)
- [Pediatrics e-cigarette article collection](#)
- [Surgeon general's interactive website about e-cigarettes geared toward parents and others who work with youths](#)