

News: Health

Hospitalizations highlight potential dangers of e-cigs to teens' lungs

Eight Wisconsin teens developed severe injuries to the organs after using the devices

By Aimee Cunningham 3:09pm, August 2, 2019



CHEMICAL PLUME Chemicals inhaled while using e-cigarettes can damage the lungs, studies have found. The devices may be why eight teens recently landed in a Wisconsin hospital with serious respiratory illnesses.

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The eight Wisconsin teens had become so short of breath that they needed to be hospitalized. Although the cause of their lung injuries remains to be determined, the teens had one thing in common: All reported vaping in the weeks and months before their hospital stays in July.

“Some of these kids were quite ill and needed a lot of support,” including the use of ventilators to help them breathe, says Jonathan Meiman, a chief medical officer with the Wisconsin Department of Health Services in Madison.

The health department’s investigation into these cases has just begun. But vaping as a culprit isn’t a stretch. With more adolescents using JUUL and other types of electronic cigarettes, sometimes frequently, “it is not surprising” that we are starting to see some children developing lung injuries, says pediatric pulmonologist Sharon McGrath-Morrow of Johns Hopkins University School of Medicine in Baltimore.

“Studies already have reported more chronic respiratory symptoms and more severe asthma symptoms in adolescents who vape,” she says.

For example, a 2017 study of more than 2,000 Southern California 11th- and 12th-graders found that teens who had used e-cigarettes had about twice the risk of having symptoms such as ongoing cough, congestion or wheezing or developing bronchitis, compared with teens who hadn’t used the products.

The Wisconsin teens reported symptoms similar to those seen with a serious respiratory illness such as the flu, including fever, difficulty breathing and nausea. The shortness of breath got worse over days or weeks, Meiman says, finally requiring hospitalization. The teens came from three different counties in southeastern Wisconsin and were all patients at Children’s Hospital of Wisconsin in Milwaukee, which alerted the state.

Pulmonologist Laura Crotty Alexander, who sees adult patients, says that she and colleagues have seen multiple cases in the last several years in which patients came in with lung disease, “and the only thing we can tie it to is their vaping habits.”

Too much inflammation in the lungs causes the injury, says Crotty Alexander, of the University of California San Diego School of Medicine. The lungs fill with inflammatory cells, and patients become short of breath and unable to get enough oxygen. Those inflammatory cells are responding to changes in the lungs that are likely caused by vaping. “The lungs don’t like it when you breathe in high concentrations of chemicals that they’re not used to,” she says.

Vaping is a multi-chemical assault on the lungs. There’s nicotine, which besides being addictive appears to damage the respiratory system. “Nicotine by itself can impair the ability of lung cells to clear mucus and foreign particles from the lungs,” which can lead to chronic respiratory symptoms, McGrath-Morrow says.

And there’s potential harm from the more than 7,000 flavors available to e-cigarette users in e-liquids, flavors that have not been tested for safety when inhaled. Heating the flavors to aerosolize them can change what’s in them, producing chemicals that can be toxic and potentially carcinogenic, McGrath-Morrow says. And when heated, the two main solvents found in e-liquids, propylene glycol and glycerin, also contribute toxicity to the plume that hits the lungs (*SN*: 8/20/16, p. 12).

From 2017 to 2018, e-cigarette use reported by teens rose 78 percent nationwide, from 11.7 percent to 20.8 percent, government data show (*SN*: 12/22/18, p. 28). A whole generation of adolescents who wouldn’t have used traditional cigarettes are now getting introduced — and potentially addicted — to nicotine through vaping, researchers say.

The long-term consequences of vaping to the lungs aren’t known, as the products are relatively new. But whatever health harms there may be will continue to emerge as kids who vape grow older. “I am concerned that these children will develop chronic respiratory symptoms and impaired lung health,” McGrath-Morrow says. This may not occur in everyone, she says, “but there is no way to predict who is susceptible to the harmful effects of these products.”

The investigation of the Wisconsin teens could provide some answers that will aid research. More details about the teens’ e-cigarette use, such as the type of device, the e-liquid, the flavors, how much they vaped and so on, “would be very helpful in trying to understand what’s going on and who else might be at risk,” Crotty Alexander says.

Citations

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