

## Health

# He went from hiking enthusiast to ‘on death’s door’ within days. Doctors blamed vaping.

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By [Lena H. Sun](#)

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Within days, Alexander Mitchell had gone from being a 20-year-old hiking enthusiast to being kept alive by two machines forcing air into and out of his lungs and oxygenating his blood outside of his body.

“He went from being sick to being on death’s door in literally two days,” recalled his father, Daniel Mitchell, as he struggled to grasp the unthinkable. “The doctor said he was dying. In all honesty, I was preparing to plan a funeral for my child. I wept and wept for this boy.”

Alexander Mitchell’s doctors at a hospital in Payson, Utah, were baffled when the tests came back negative for bacterial pneumonia and a host of common ailments. One exam, though, picked up something unusual — evidence of abnormal immune cells in his lungs — generally associated with a rare, potentially deadly pneumonia seen in older people who accidentally inhale droplets from oil-based laxatives like mineral oil.

A doctor’s hunch would help save Mitchell’s life. The young man’s lungs had failed — he had [acute respiratory distress syndrome](#), a life-threatening and often fatal injury of the lungs. The doctor told the family he suspected the condition was linked to vaping after hearing about similar cases elsewhere. The Provo, Utah, man and his parents had mentioned he used e-cigarettes. But until then, no one had connected the dots. Doctors had him airlifted to the University of Utah hospital in Salt Lake City, 65 miles away, so they could put him on the most advanced life support to keep oxygen flowing and allow his lungs to heal.

Mitchell’s case is among the most serious doctors have seen among the vaping-related [lung illnesses now under investigation](#) by state and federal health officials — at least 193 cases in 22 states, many involving teens and young adults. On Friday, Illinois health officials announced the [first known death](#) from a vaping-related lung illness in an adult. They declined to provide further details. Meanwhile, state health departments are reporting a [growing number](#) of cases.

There are more questions than answers about the lung illnesses and their link to devices that have surged in popularity despite little research on their long-term effects. [E-cigarettes](#) were introduced as a way to help

smokers quit by satisfying their nicotine cravings without lighting up, but their use is now at [epidemic levels](#) among teenagers and young adults.

Those who have fallen ill have vaped different substances, including nicotine, marijuana-based products and do-it-yourself “home brews” over different durations and in different places. Although the cases appear similar, [officials from the Centers for Disease Control and Prevention caution](#) they don’t know whether the illnesses are associated with the e-cigarette devices themselves or with specific ingredients or contaminants inhaled through them. It isn’t even clear they have a common cause or whether they might be different diseases with similar symptoms.

The severity of some of the illnesses in previously healthy young people has unnerved family members and even some doctors.

“To see patients this sick, this is extremely alarming,” said Sean Callahan, a University of Utah pulmonologist.

Alexander Mitchell thought he had the flu when he woke up earlier this summer with severe nausea, chest pains and trouble breathing. But he deteriorated so quickly that his parents, and then even the doctors, were astonished.

For his parents, the scariest moment may have come when doctors said their son’s lung failure required an additional aggressive life support machine known as [ECMO](#). The machine pumps blood from the patient’s body to an artificial lung that adds oxygen and removes carbon dioxide, replacing the function of the person’s own lungs. The machine then sends the blood back to the patient.

“He had two tubes coming out of him, one was dark crimson red, and the other was bright red,” Daniel Mitchell recalled. “The doctors said a third of his blood was out of his system at any one time.”

If Alexander pulled out his tubes, they warned his parents, “he would be dead in 30 seconds and there was nothing we could do.”

Doctors told the parents he might need a lung transplant if he didn’t show improvement. But after about nine days, the life support machines allowed his lungs to heal. He was able to go home July 7.

The University of Utah doctors who saw Mitchell, in addition to four similar cases this summer, have their own theory about what might be causing the vaping-related illnesses.

They say one culprit may be the liquid, commonly known as vape juice, that is a component of all e-cigarettes. The products vary greatly, but all contain a heating element that produces an aerosol from a liquid that users inhale through a mouthpiece.

The surge in cases may be the result of something recently added to the oils “to dilute or add to them,” said Scott Aberegg, a University of Utah hospital pulmonologist and critical care specialist, who cared for Mitchell and four other patients at his hospital and consulted on two others at another facility.

Some of the patients had vaped for months and years, he said, so if there had been a previous cluster of cases, “we would have recognized it earlier.”

Tracing the vaping liquid back to where it was purchased, however, has been difficult in some cases. Some patients said they bought ingredient-containing cartridges in other states. One patient told doctors he got his cartridges in Las Vegas and it appeared they had been opened, presumably to introduce [THC](#), the main ingredient that produces the mind-altering effects of marijuana, Aberegg said. THC is not legal in Utah.

Vaping liquid may contain nicotine, flavorings, propylene glycol, vegetable glycerin and other ingredients, according to the Food and Drug Administration, which [regulates](#) tobacco products, including [e-cigarettes](#).

When the liquid is heated, the resulting aerosol can contain fine and ultrafine toxic particles, including heavy metals, chemicals used for flavoring, such as diacetyl, linked to a serious lung disease known as “[popcorn lung](#),” and volatile organic compounds that can cause long-term health effects, including cancer, according to a [2016 U.S. surgeon general report](#).

“We don’t know if it’s the propylene glycol or the glycerin or other additives in the vaping liquids put there by the manufacturers, or those things in combination with other adulterants, post manufacturing, when people are adding or mixing them,” Aberegg said.

Some of the Utah patients had milder illnesses than Mitchell’s. But four of the five also had abnormal immune cells in their lung specimens, Aberegg said. Such cells are indicators of a variety of diseases, including a rare

condition known as lipoid pneumonia, whose symptoms include chest pain and difficulty breathing — similar to the symptoms of bacterial pneumonia.

Aberegg cautioned that much remains unknown about what causes the abnormal immune cells in those with vaping-related illness.

But “in many of the cases, we have a high level of confidence that what we are dealing with is not just association, but caused by vaping and whatever was within the products,” Aberegg said. The abnormal cells may be a “very important marker of vaping-related pneumonia” and “an important clue to what’s going on.”

Six weeks after he left the hospital, Mitchell has resumed hiking. But with his lung capacity diminished by 25 percent, he doesn’t go for long or as often as he used to. He also struggles with his short-term memory. Doctors say they’re not sure whether he will fully recover.

Doctors say his youth was a crucial factor in his survival. “He was young, otherwise healthy, and in good strong physical condition prior to onset of illness,” said Aberegg, one of about 20 clinicians who treated the young man.

Mitchell said he has little recollection of what happened while he was in the hospital since he was in a medically induced coma for much of the time. But he is stunned that doctors attribute his near-death experience to vaping — a practice he began about two years ago because he wanted to quit conventional cigarettes.

“It’s promoted as healthier,” he said.

Mostly, he said he vaped flavored nicotine products but has used THC a few times with friends, he said. None of them has gotten sick.

In mid-June, Mitchell said he bought a different brand of vape juice — peach menthol flavor — from his regular vape shop and used it with his same e-cigarette device. It was the first time he used a well-known brand. The family did not want to identify it until the FDA investigates further. “It was a brand new box,” Mitchell recalled. Inside, “the bottle had a seal.”

He said he vaped less than usual that time. The next day, he felt sick and began his life-changing medical odyssey.

Adults can make decisions for themselves, Mitchell said. But he said his experience should be a warning about dangers that aren't spelled out clearly about vaping.

"I didn't think it would lead to me literally being on my death bed," he said.

*Alice Crites contributed to this report.*

**Lena H. Sun**

Lena H. Sun is a national reporter for The Washington Post covering health with a special focus on public health and infectious disease. A longtime reporter at The Post, she has covered the Metro transit system, immigration, education and was a Beijing bureau chief. Follow [🐦](#)

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