

E-cigarette users getting burned by exploding batteries

[John Wisely](#), Detroit Free Press



The U.S. surgeon general is calling e-cigarettes an emerging public health threat to the nation's youth.
USA TODAY

Some victims need skin grafts after suffering 3rd-degree burn when vaping pen's lithium ion batteries explode



(Photo: Courtesy of Scott Becker)

Story Highlights

- Vaping popularity has soared in recent years.
- E-cigarettes use batteries to generate the heat to form the vapor.
- Lithium ion batteries can short circuit and explode.
- Burn center officials say they are seeing more injuries related to batteries from e-cigarettes.

Scott Becker was sitting at conference table conducting a work meeting when the lithium ion battery that powers his e-cigarette exploded in his pocket.

"It was like having a firework go off in your pocket," said Becker, 46, of Washington Township. "I threw my chair back, I started hitting my pants and my hip. I saw the sparks shooting out of my jeans."

Beckers suffered third-degree burns and a year later, they still require treatment three times a day.

Injuries like Becker's are becoming more common, said Karla Klas, managing director for injury prevention and community outreach at the Trauma Burn Center at the University of Michigan in Ann Arbor.

The batteries can explode with enough force to knock out teeth and crack vertebrae if they fail in the mouth of the user.



Scott Becker, 46, of Washington Township, suffered a third-degree burn on his right hip last year when a battery he used in his vaping pen exploded. (Photo: handout, Scott Becker)

"We've been seeing some pretty deep burns," Klas said.

Klas made a presentation on the topic at the American Burn Association's annual conference last month in Boston. While she hasn't heard of any deaths caused by exploding e-cigarettes, an informal poll of representatives from about 20 burn centers around the country tallied almost 300 recent burn cases that required hospitalization, she said.

"Not only are the burns deep, but because of the chemicals that are in the batteries, it's almost like they are having a chemical burn on top of the thermal burn," Klass said.

The Federal Aviation Administration banned the devices from checked baggage because of the fire risk.

Read more:

[Study finds most teens vaping fruity flavors, not nicotine](#)

[E-cigarette use attracts far more teens than adults](#)

[E-cigarette explodes; Dingell calls for action by FDA](#)

Vaping proponents insist the incidents are rare and preventable through proper use of the products and their batteries.

"When used and charged properly, those lithium-ion batteries pose no more of a fire risk than other products that use other similar batteries," said Gregory Conley, president of the American Vaping Association, a nonprofit group that advocates vaping as a way to help people stop smoking. "It is a remote risk that is almost entirely avoidable."

Conley said he worries that exaggerated fears of fires could cause some people to avoid vaping and instead, continue a deadly habit, cigarette smoking. But critics say the problem is real and it's growing.

"Even if it's somewhat rare, these things are so dangerous that when it happens, these are horrific injuries," said Wolfgang Mueller, a Farmington Hills lawyer who has sued on behalf of three injury victims, including Becker.

Mueller, who worked as a mechanical engineer before studying law, said the batteries can short-circuit internally because of poor manufacturing or externally by coming in contact with metal in someone's pocket, like coins, keys or jewelry.

"That's what makes it so important for these retailers and manufacturers to warn the consumer," he said.

Third-degree burns

Becker, 46, is an automotive engineer. He had purchased an e-cigarette with an LG battery in it and bought a second battery as a backup.

On April 1, 2016, he slipped the spare battery into his pocket and headed to a meeting in Windsor.

"I was in a meeting at work and it starting sizzling," Becker said. The battery eventually burned through his pocket and fell spinning on the floor and filling the conference room with black smoke, Becker said.

He ended up with a softball-sized burn on his right hip that took skin grafts to fix.

"There's a divot there where they had to go in and cut the muscle out to get all of the burn out," Becker said. "I still have to put ointment on it three times a day and it's been a year."



These are the jeans Scott Becker of Washington Township was wearing when a lithium ion battery exploded in his pocket. (Photo: Courtesy of Scott Becker)

His medical bills are more than \$150,000.

Mueller said he tried suing the store that sold the device and the batteries, but found they had no insurance so he's preparing a suit against LG.

Vaping history

E-cigarettes or vaping pens were first patented in 2003 and became available in the U.S. in 2007, according to a [2014 report](#) by the U.S. Fire Administration. Users pour oils, which typically include nicotine, into the tank of the pen.

With the press of button, a built-in battery-powered heating element quickly heats the oils to about 400 degrees. At that temperature, the oils don't combust, but they do form a vapor which can then be inhaled.

While nicotine-laced chewing gum and skin patches had been around for years, e-cigarettes offered advantages for smokers looking to quit. They mimic the smoking experience and deliver the nicotine without creating the carcinogens associated with cigarette smoke.

With about 44 million smokers in America, an estimated 9 million to 10 million people have used a vaping pen in the past 30 days, Conley said.

"You have a product that has literally helped 2.5 million Americans quit the deadliest habit on the planet," Conley said.

Battery issues

But generating all that heat instantly requires a ready energy source and traditional disposable batteries run down quickly in the devices. Most vape pens come with rechargeable lithium-ion batteries and vape shops sell spares for when those run down.

Lithium ion batteries are so good at storing energy that they are used in cameras, power tools, even electric cars. The batteries carry about 20% of the power of TNT weighing the same amount, said Daniel Doughty, a chemist who worked for the U.S. Department of Energy for 20 years and now runs Battery Safety Consulting in Albuquerque, N.M.

"If they are made in a quality manufacturing facility, that stored energy is released in the manner you want, when you want it," he said. "If it goes off unintended or in an uncontrolled manner, that energy is significant."

He noted that the batteries include aluminum foil on the positive electrode.

"It gets hot enough to melt aluminum, which melts at about 1,220 degrees (Fahrenheit)," he said.

He has examined many failed batteries to diagnose the problems.

"The worst failure for a cell is what's called an internal short circuit," Doughty said. "If there is a little foreign metal particle in there, that could work. It creates that shorting point. The higher level the charge, the more severe the accident."

Doughty said reputable battery makers prevent adulterated materials from getting into their products by manufacturing them in elaborate "clean rooms." But with an estimated 5 billion such batteries being sold annually, low-cost knock-offs are common from companies that aren't as careful.

"There are a lot cheap cells that are coming out of China," Doughty said. "That raises the question of, are they really watching their manufacturing?"

Some battery makers now warn retailers not to sell the batteries for use in e-cigarettes because they are intended for larger products like cameras and tools, which have more protective housing around the battery.

Conley of the Vaping Association said some vape shops around the country now require battery buyers to read and sign a waiver indicating they understand the risks and how to properly use the products to minimize risk.

But Mueller said vape shops don't warn buyers to the dangers or offer advice on safe use of the batteries.

'Like a hot dog'

Sean Ritz, 35, of Canton said he received no warning when he bought his e-cigarette and batteries to use in it and he's now suing Wild Bill's Tobacco, a vape shop in Westland, where he bought them.

He was at home on Oct.22 when a battery exploded. He'd spent the day moving into a new house with his pregnant wife and was in the basement moving boxes when the battery exploded.

"I heard a fizzing noise. It was absolutely terrifying. It was loud, smoke was shooting out," Ritz said.



Sean Ritz, 35, of Canton suffered third-degree burns on his left leg when the battery to an electronic cigarette exploded in his pocket Oct. 22, 2016. (Photo: Courtesy of Sean Ritz)

His wife looked on in horror as he tried to wrestle his jeans off. He ended up with third-degree burns all the way down his leg.

"It looked like a hot dog you leave on the grill too long; completely black and cracked in a few places," Ritz said. "I peeled a piece of it off, and realized it was part of my skin."

Ritz ultimately spent 12 days at the burn center at the University of Michigan, including four days in intensive care.

"These things are dangerous," he said. "If I'd known this stuff, I could have saved myself a tremendous amount of anguish."

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