

## E-cigarette explosions: A doctor's view

October 12 2016, by Karen Kaplan, Los Angeles Times

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It was an injury unlike any Dr. Elisha Brownson had seen - a young man whose teeth were blown out when his electronic cigarette exploded in his mouth. His injuries were so severe he was admitted to the trauma intensive care unit.

"I had never heard of an [injury](#) mechanism like this before," said Brownson, a surgeon who specializes in treating people with burns. The injuries "left a gruesome impression on me."

Unfortunately, this wasn't an isolated case. More victims of exploding vaping devices followed, until Brownson and her colleagues at the University of Washington Medicine Regional Burn Center in Seattle saw about two such [patients](#) each month.

Fifteen of those cases are described in the *New England Journal of Medicine*. All of the patients were injured using electronic cigarettes or personal vaporizers, which rely on a [lithium-ion battery](#) to heat a liquid that is inhaled in an aerosol form.

Though lithium-ion batteries are generally safe, some can overheat. When that happens, they can explode. (The technical term is "thermal runaway.") That's what happened to the 15 patients who were seen in the UW burn center between October 2015 and June 2016.

Among these patients, 80 percent suffered flame burns and 33 percent received chemical burns from the alkali elements in the exploding batteries. In addition to burns, 27 percent of the victims suffered [blast](#)

[injuries.](#)

The most common site of injury was the groin or thigh (53 percent of cases), followed by the hands (33 percent of cases) and the face (20 percent of cases), according to the report.

Some of the injuries have been disfiguring, and some have affected victims' physical function. In addition to losing teeth, patients have lost portions of their soft tissue (a category that includes skin, ligaments, fat and tendons). Some have been left with "traumatic tattoos."

Many of the patients treated at the UW burn center are eager to warn others of the risk that vaping devices could explode. To that end, they have allowed Brownson and her colleagues to share photos of their injuries.

"People who use e-cigarettes must be aware of the danger of explosion," said Brownson, who now works at the Alaska Native Medical Center in Anchorage.

The U.S. Food and Drug Administration has recognized e-cigarettes and other vaping devices as tobacco products that fall under its jurisdiction. However, it's not clear whether the agency intends to regulate the batteries in the devices, the study authors noted.

"E-cigarettes are a public safety concern that demands increased regulation as well as design changes to improve safety," they wrote.

To minimize the risk, e-cigarette users "should not alter the device and should keep batteries safely stored when not in use," Brownson said.

"However, even with these precautions, we have seen explosions occur."

Odds are, other doctors will too.

"We suspect that with the growing use of (personal vaporizers), many hospitals around the country will see an increase in injuries related to e-cigarette explosions," the study authors wrote.

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Citation: E-cigarette explosions: A doctor's view (2016, October 12) retrieved 26 April 2024 from <https://medicalxpress.com/news/2016-10-e-cigarette-explosions-doctor-view.html>

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