

# Study: E-cigarettes may be more harmful to heart health than tobacco

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A new study from researchers at the Smidt Heart Institute at Cedars-Sinai shows that electronic nicotine delivery systems, including devices such as e-cigarettes, may be just as harmful to the heart, if not more, than traditional cigarettes. The findings were presented today at the annual American Heart Association Scientific Sessions 2019.

"What makes e-cigarettes so harmful to the heart and lungs is not just nicotine," said senior author Florian Rader, MD, MSc, medical director of the Human Physiology Laboratory and assistant director of the Non-Invasive Laboratory at the Smidt Heart Institute. "It's the completely unknown bucket of manufactured products used to form vapors that is likely causing the most harm. This is what we believe is underlying the current public health problem."

These findings come at a crucial time, as reports of lung-related e-cigarette injuries are increasing, even while many distributors continue to claim that using e-cigarettes are safe and can help tobacco cigarette smokers kick the habit.

A recent study by the Food and Drug Administration found that 27.5% of high school students used e-cigarettes in 2019, compared to 20.8% in 2018. The same study also estimates 3.62 million middle and [high school students](#) were e-cigarette users in 2018.

In the Smidt Heart Institute study, the team of researchers compared healthy, young-adult smokers aged 18 to 38 who were regular users of e-cigarettes or tobacco cigarettes. The researchers then measured participants' [blood flow](#) to the [heart muscle](#)-focusing on a measure of coronary vascular function-before and after sessions of either e-cigarette use or cigarette smoking, while participants were at rest and also after they performed a handgrip exercise which simulates physiologic stress.

In smokers who used traditional cigarettes, blood flow increased modestly after traditional cigarette inhalation and then decreased with subsequent stress. However, in smokers who used e-cigarettes, blood flow decreased after both inhalation at rest and also after handgrip stress.

"Our results suggest that e-cigarette use is associated with coronary vascular dysfunction at rest, even in the absence of physiologic stress," said Susan Cheng, MD, MPH, MMsc, director of Public Health Research at the Smidt Heart Institute and director of Cardiovascular Population Sciences at the Barbra Streisand Women's Heart Center. "These findings indicate the opposite of what e-cigarette and vaping marketing is saying about their safety profile."

The original concept and design of this study was initiated by the late Ronald G. Victor, MD, a foundational pioneer in cardiovascular physiology studies.

"We have known for decades that smoking increases your risk for heart attack and dying from

heart disease," said Christine Albert, MD, MPH, founding chair of the newly established Department of Cardiology at the Smidt Heart Institute. "Now, with this study, we have compelling evidence suggesting that newer methods of electronic nicotine delivery may be equally, or potentially more, harmful to your heart as [traditional cigarettes](#) ."

Given that e-cigarettes represent a relatively new product on the market, Albert cautions users that there may be a number of unforeseen health effects.

To better understand the potentially dangerous consequences of e-cigarettes, Rader, Cheng and investigators in the Human Physiology Laboratory at the Smidt Heart Institute plan on studying the mechanisms underlying changes in [heart](#) and blood vessel flow seen in their work to-date, as well as the effects of [e-cigarette](#) use across a more diverse population of study participants including those with existing cardiovascular risk.

"What we are learning from our own research, along with the work of others, is that use of any electronic nicotine delivery system should be considered with a high degree of caution until more data can be gathered," said Rader.

Provided by Cedars-Sinai Medical Center

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