

## Study reveals a need to evaluate and regulate 'electronic cigarettes'

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(PhysOrg.com) -- Electronic cigarettes should be evaluated, regulated, labeled and packaged in a manner consistent with cartridge content and product effect - even if that effect is a total failure to deliver nicotine as demonstrated in a study supported by the National Cancer Institute and led by a Virginia Commonwealth University researcher.

The research was published in the Online First issue of the journal *Tobacco Control*. The article will appear in the February print issue of the journal.

Electronic cigarettes consist of a battery, heater and cartridge containing a solution of nicotine, propylene glycol and other chemicals and have been marketed to deliver nicotine without tobacco toxicants. Despite no published data concerning safety or efficacy, these products are sold in shopping malls and online. Further, "electronic cigarettes" currently are unregulated in the U.S., unlike other products intended to deliver nicotine to [smokers](#) such as lozenges, gum and patches.

"Consumers have a right to expect that products marketed to deliver a drug will work safely and as promised. Our findings demonstrate that the 'electronic cigarettes' that we tested do not deliver the drug they are supposed to deliver. It's not just that they delivered less nicotine than a cigarette. Rather, they delivered no measurable nicotine at all. In terms of nicotine delivery, these products were as effective as puffing from an unlit cigarette," said principal investigator Thomas Eissenberg, Ph.D., professor in the VCU Department of Psychology.

According to Eissenberg, these findings are important because they demonstrate why regulation of these products is essential for protecting the welfare and rights of consumers. With regulation, consumers can expect that these and similar products will be evaluated objectively and then labeled and packaged in a manner that is consistent with the drug they contain and the effects they produce, he said.

"Regulation can protect consumers from unsafe and ineffective products, but these products have somehow avoided regulation thus far. Our results suggest that consumers interested in safe and effective nicotine delivery need to be very wary of unregulated "electronic cigarettes," said Eissenberg.

In Eissenberg's study, 16 participants engaged in four different sessions - each separated by 48 hours - which included smoking their preferred brand of cigarettes, puffing an unlit cigarette, or using one of two different brands of "electronic cigarettes" loaded with "high" strength, which is 16 mg, nicotine cartridges. Eissenberg and his team measured the level of nicotine in the participants' blood and also their [heart rate](#) and craving for a cigarette/nicotine.

They observed that when participants used the two brands of "electronic cigarettes," there was no significant increase in nicotine levels or heart rate, and little reduction in craving. However, when participants smoked their own brand of [cigarettes](#), substantial and significant increases in plasma [nicotine](#) and heart rate, and decreases in craving were observed.

Eissenberg, who is director of the VCU Clinical Behavioral Pharmacology Laboratory and a researcher with the VCU Institute for Drug and Alcohol Studies, has completed a series of studies demonstrating how clinical laboratory methods can be used to evaluate the toxicant exposure and other effects of novel products for tobacco users.

Provided by Virginia Commonwealth University

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