

# The rise of e-cigarettes

March 11 2014, by Margarita Gallardo

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The use of electronic cigarettes has grown rapidly across the United States, prompting questions about their safety and whether they serve as a gateway to conventional cigarettes or a means of kicking the habit—or at least of sustaining a nicotine addiction without inhaling the carcinogens in smoke.

Robert Jackler, MD, is professor and chair of otolaryngology and the Edward C. and Amy H. Sewall Professor in Otolaryngology. His research group, Stanford Research Into the Impact of Tobacco Advertising, has been closely following the e-cigarette industry. He recently spoke with Paul Costello, chief communications officer at the School of Medicine, for a 1:2:1 podcast. Following is an edited transcript of their interview.

## **Q: How were e-cigarettes developed? How did they come about?**

Jackler: Electronic cigarettes were developed by a Chinese inventor in 2004. They came on the market in Europe in 2006 and America in 2007. They are a family of products that produce a water vapor mixed with substances that create a mist that looks like smoke—usually propylene glycol, variable doses of nicotine and, often, flavors. They come in various sizes, some the size of a cigarette, others like a pen, and hose-sized variants called eHookahs. Their growth has been exponential. It still represents a relatively small fraction of the tobacco-sales market—about 2 percent. But it's been tripling every year since 2007. It was a \$1.8 billion industry in 2013.

**Q: You've pointed out the similarity between the advertising of tobacco—how it used Hollywood and a wide range of marketing—and how e-cigarettes are now doing the same thing. Where is it most profound?**

Jackler: It's basically the entire playbook that cigarette products—Camel, Lucky Strike, Marlboro—used in the mid-20th century but that has been outlawed by the Federal Trade Commission. All those styles of advertising have come back in the absolutely unregulated environment of e-cigarettes. So you have television, including on the Superbowl, and radio ads. You have pictures of doctors enjoying e-cigarettes, connoting their healthfulness. You have flavors like chocolate, gummy bear and honey.

**Q: Those kinds of flavors are aimed at kids, right?**

Jackler: Well, the industry professes that it is targeting experienced adult smokers of combustible tobacco to transition them to the arguably healthier vapor products. But if that were the case, why would they engage Courtney Love as a spokesperson? Why would they sell cotton-candy-flavored cigarettes and beer-flavored e-cigarettes to allow a kid to break two adult taboos at once—alcohol and smoking—in a single activity?

To diminish the possibility that e-cigarettes will become a gateway product for teen [nicotine addiction](#), flavors should be banned from nicotine-containing vapor.

Another problem is that e-cigarettes are not regulated in the United States, although the Food and Drug Administration has plans to do so. There is little research on the effects of [propylene glycol](#) on the lungs when inhaled at the concentrations delivered by an e-cigarette. Flavors

added to the liquid solution are aldehydes, ketones and chemicals that have been synthesized. But you're not eating these chemicals. You're breathing them deeply, exposing them to the alveoli deep in your lungs. We don't know the effect of inhaling substantial concentrations of these chemicals over time. The liquid could also be contaminated with bacteria, or with cadmium or other heavy metals. Controls in the vapor-liquid industry are not very strong.

## **Q: How has Big Tobacco entered into the fray?**

Jackler: We're in the early entrepreneurial stage of [electronic cigarettes](#). In fact, there are only about four or five manufacturers of these devices. All of them are in China, and if you look at the over 250 brands on sale today, many of them look alike. In fact, Paul, you could create an electronic cigarette company very quickly. You simply order up the devices, have them put your name brand on them—like Paul Costello e-cigarettes—and they'll ship a pallet of them to you next week if you'd like. This is why there are so many brands.

The market has been dominated by small companies—startup companies like NJOY and Blu that have done very well. We are in the midst right now of a transition. Blu was bought by Lorillard last year, and now we're seeing the big boys, R.J. Reynolds, Altria and Lorillard, coming on very strong.

The major companies, within a few years, will buy up the small independents so they will own both end of the markets—cigarettes and e-cigarettes. Imagine Coca-Cola. You have sugary Coke and sugar-free Diet Coke, so you have obesity and anti-obesity. R.J. Reynolds and Altria will have Camel and Marlboro, but they'll also have their vapor product, so you can either have your nicotine addiction or have your nicotine addiction with cancer-causing chemicals.

What the industry would like to see you do is when you go to a place that you can't smoke, you pick up your e-cigarette and vape—the term for the equivalent of smoking with cigarettes—and that way you get your nicotine dose in the airport or when you're in your workplace, or even when you're in school. And when you leave school or the workplace, you go back to the combustible tobacco products.

To discourage perpetuation of nicotine addiction through dual use of tobacco and vapor products, it will be important to extend place-of-smoking regulations presently in place for tobacco to e-cigarettes.

## **Q: So this is a win-win for tobacco companies?**

Jackler: Right. The only win for public health would be if established tobacco smokers moved over en masse to vapor-based products and abandoned cigarettes, cigars and pipes.

Now, you might ask yourself, "How often does that happen?" There was a recent *Lancet* paper on cigarette smokers who wanted to quit. Are e-cigarettes better than the gums and the patches that are currently marketed as nicotine-replacement products? The answer is yes. They're about twice as good. But in reality, fewer than one in 10 adult smokers that adopt electronic cigarettes do so to actually eliminate smoking combustible cigarettes. Most of them continue to use both.

Another issue is that [e-cigarettes](#) could lead to the renormalization of tobacco and smoking. If you look at the way it is with an e-cigarette, it absolutely replicates the hand-to-mouth ritual of smoking. It satisfies that primordial urge to suck on something, so a person who's vaping looks like someone who's smoking.

The issue is all about young people. Young people want to do what's cool. Young people want to do what other people are doing. If they see

people smoking, or vaping, they don't necessarily know the difference, so I think part of the motivation to limit electronic-cigarette use in public places is so that [young people](#) won't see it as normal, ordinary, acceptable behavior once again.

Provided by Stanford University Medical Center

Citation: The rise of e-cigarettes (2014, March 11) retrieved 9 April 2024 from <https://medicalxpress.com/news/2014-03-e-cigarettes.html>

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