



ELECTRONIC CIGARETTES: HYPE VERSUS SCIENCE

Audrey Darville, PhD, APRN, CTTS, FAANP

July 18, 2016

audrey.darville@uky.edu

SESSION OBJECTIVES

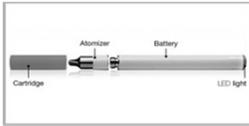
- Describe the current state of electronic vaporizing products.
- Identify current use patterns of electronic vaporizing products.
- Explore health and safety concerns associated with the use of electronic vaporizing products.

EXPECTED OUTCOMES

The participant will:

- Increase knowledge and awareness of electronic vaporizing products.
- Understand what is known about current use patterns of electronic vaporizing products.
- Assess the risk/potential benefit of electronic vaporizing products.

WHAT IS AN ELECTRONIC SMOKING DEVICE?



Developed in China in 2003; introduced in Europe and the US in 2006-2007 and banned for sale/distribution in many countries; tested by the FDA in 2009 where inconsistencies were found in labeling versus actual ingredients and the product was refused approval in the U.S.

WHY THE INITIAL CONCERN?

- Cessation treatment claims led FDA to initially pursue regulation as a drug delivery device
- FDA testing found nicotine levels varied widely
- Toxins (di-ethylene glycol) were found in one sample tested and ingredients were variable in others
- Early case report raised concern for potential harmful effects to the lungs

REGULATION?

- The court ruled E-cigarettes are a tobacco product and not a drug delivery device
- The FDA has approved an expanded definition of tobacco products to include: electronic cigarettes, cigars, pipe tobacco, certain dissolvables, gels, and waterpipe tobacco (hookah)

WHAT DO WE KNOW ABOUT E-CIGS?



WHAT'S IN THEM?

- Currently at least 400 types of e-cigarettes
- Over 7000 potential ingredients have been identified; generally e-juice contains 40-60 chemicals
- Contain nicotine, a highly addictive substance
- Formaldehyde has been found in high-output devices
- Particulates have been found in the vapor

THEY DON'T PRODUCE CARBON MONOXIDE BUT DO CONTAIN:

- Nicotine
- Acetaldehyde
- Formaldehyde
- Acetone
- Styrene
- Propylene glycol
- Xylene
- Particulates and more....



WHO IS USING THEM?

Data from 2012–2013 National Adult Tobacco Survey (NATS) found 1.9% of everyday tobacco users with the following characteristics are most likely to use e-cigs:

- Slightly more men than women
- Very few people over 65
- Those with a GED
- LGBT populations



MMWR 63(25);542-547/June 27, 2014

E-CIG USE PATTERNS

- Current or former smokers, many using with intent to reduce smoking
- Youth often along with conventional tobacco use
- Devices modified for use with substances/drugs other than nicotine
- In England, NRT use declined proportional to increases in e-cig use

HOW POPULAR ARE THEY?

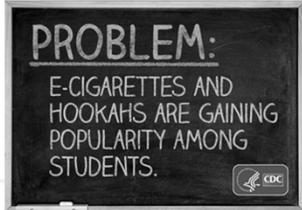
For US Adults In 2014 (CDC/National Health Interview Survey data):

- 16.8% were current cigarette smokers
- 12.6% had tried electronic cigarettes
- 3.7% reported current use



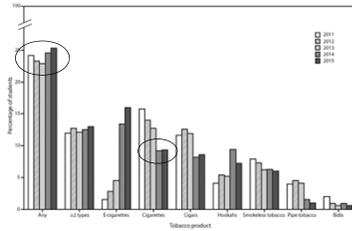
From 2013-2014, current electronic cigarette use (CDC, National Youth Tobacco Survey):

- Rose from 4.5% to 13.4% among HS students
- Rose from 1.1% to 3.9% among MS students



CONCERNS FOR YOUTH

- 5.6 million Americans aged <18 years who are alive today are projected to die prematurely from smoking-related disease
- Are e-cigarettes a "gateway product"?



Estimated percentage of high school students who currently use (past 30 day) any tobacco products, ≥2 tobacco products, and select tobacco products—National Youth Tobacco Survey 2011–2015

WHY IS THIS IMPORTANT?

- Nicotine is a highly addictive substance that can generate life-long, branded users
- Reward, Attention, Cognitive Control, Anxiety, & Arousal are all affected by the action of nicotine on the brain
- The younger the age of exposure to nicotine, the harder it is to quit
- The tobacco industry is aggressively marketing these products to youth

WHO CAN GAIN FROM INCREASED USE?
ALL MAJOR TOBACCO COMPANIES HAVE/ARE DEVELOPING
E-CIGARETTES



<http://www.forbes.com/sites/danielfisher/2014/05/28/philip-morris-international-bets-big-on-the-future-of-smoking/>

BENEFITS TO TOBACCO USERS?

- Studies are underway: Indications "dual use" more common than cessation
- Not an approved cessation treatment; no consistent evidence of benefit
- Risk/Benefit is tipped toward reduced harm (primarily avoidance of CO exposure) but there are still many unknowns
- Will smoking be reduced on a population level or will use "re-normalize" smoking???

"E-CIGARETTE RESEARCH: SMOKIN' HOT, CONTROVERSIAL" * & FOCUSED ON:

- Identifying use patterns, including potential for cessation
- Identifying constituents
- Health and safety effects, including population level harm reduction and risk/benefit
- Marketing strategies

*Pauline Anderson, July 17, 2014 as part of Medscape Cardiology Series: July 6, 2014

E-CIG CONSTITUENT CONCERNS

- No uniform standards or regulation regarding production or content
- FDA is currently funding research centers with the goal of establishing safety standards
- A few studies have identified particulates in the vapor, including tiny shards of tin
- Products are getting better at delivering nicotine more efficiently and at higher levels

NOT REGULATED AS A DRUG DELIVERY DEVICE, BUT...

The Office of National Drug Control Policy is currently releasing information from the DEA regarding E-cigarettes:

“Vapor pens allow the user to vaporize various liquid products from the same device and are more easily used to vaporize higher potency marijuana extract concentrates like THC oil, hash oil, and marijuana wax.”

July 2, 2014 email communication from ONDCP

HEALTH AND SAFETY CONCERNS

- Calls to poison control have increased as use has dramatically increased (there is no childproof packaging and bubble gum, chocolate, etc. flavors appeal to kids)
- Nicotine in juice can be highly concentrated and absorbs through the skin
- A case report of lipoid pneumonia attributed to e-cig use in a young woman was published in Chest in 2012
- There have been reports of devices exploding or catching fire: <http://www.nbcnews.com/news/us-news/e-cigarette-battery-explodes-burning-man-s-leg-n524941>

BOTTOM LINE...

- E-cigs are good for the tobacco industry and they are developing new twists on the product
- The vapor is not water but contains known harmful ingredients
- There are currently significant lapses in regulation, product safety and quality control
- E-cigs are being target marketed and used by youth, tactics are similar to old cigarette ads
- There is no good evidence yet to recommend them for cessation, and additional studies are underway
- Harm reduction???
- Smoke-free policies vary related to protection from e-cig vapor despite evidence that the vapor contains particulates

SELECTED REFERENCES:

Anderson, Pauline. e-Cigarette Research: 'Smokin' Hot, Controversial. Medscape. Jun 17, 2014. http://www.medscape.com/viewarticle/926878?content=edit_spec

Arazola RA, et al. Tobacco use among middle and high school students - United States, 2011-2014. MMWR Morb Mortal Wkly Rep. 2015;64(14):381-385

Bonowitz, N. L. & Goniewicz, M. L. (2013). The Regulatory Challenge of Electronic Cigarettes. JAMA. doi: 10.1001/jama.2013.109501

Brandon TH, et al. (2015) Electronic Nicotine Delivery Systems: A Policy Statement from the American Association for Cancer Research and the American Society of Clinical Oncology. Clin Cancer Res. 21(3):514-525.

Bullen, C., et al. (2013). Electronic cigarettes for smoking cessation: a randomised controlled trial. Lancet. doi: 10.1016/S0140-6736(13)61842-5

Cummins, S. E., et al. (2014). Use of e-cigarettes by individuals with mental health conditions. Tob Control. 23 Suppl 3, i48-i53. doi: 10.1136/tobaccocontrol-2013-051511

England LJ, et al. (2015) Nicotine and the Developing Human: A Neglected Element in the Electronic Cigarette Debate. Am J Prev Med. 2015. doi: 10.1016/j.amepre.2015.01.015

Goniewicz, M. L., et al. (2013). Levels of selected carcinogens and toxicants in vapour from electronic cigarettes. Tob Control. doi: 10.1136/tobaccocontrol-2012-050859

Grana R, et al. (2014) E-Cigarettes: A Scientific Review. Circulation. 129(19):1972-1986.

Hajek P, et al. (2014) Electronic cigarettes: review of use, content, safety, effects on smokers and potential for harm and benefit. Addiction. 109(11):1801-1810.

Hughes K, et al. (2015) Associations between e-cigarette access and smoking and drinking behaviours in teenagers. BMC Public Health. 15:244.

Lee YH, Gawron M, Goniewicz ML. (2015) Changes in puffing behavior among smokers who switched from tobacco to electronic cigarettes. Addict Behav. Sep;48:1-4. doi: 10.1016/j.addbeh.2015.04.003.

McRobbie H, et al. (2015). Electronic cigarettes for smoking cessation and reduction. Cochrane Database Syst Rev. 2015; 12:CD010216.

Patnode C, D., et al. (2015). Behavioral Counseling and Pharmacotherapy Interventions for Tobacco Cessation in Adults, Including Pregnant Women: A Review of Reviews for the U.S. Preventive Services Task Force. Ann Intern Med. 163(6).

Singh T, Arazola RA, Corey CG, et al. (2016). Tobacco Use Among Middle and High School Students — United States, 2011–2015. MMWR Morb Mortal Wkly Rep. 2016;65:361–367.

Williams, M., et al. (2013). Metal and Silicate Particles Including Nanoparticles Are Present in Electronic Cigarette Cartridge Fluid and Aerosol. PLoS One, 8(3), e57987. doi: 10.1371/journal.pone.0057987

Zhu SH, et al. (2014). Four hundred and sixty brands of e-cigarettes and counting: implications for product regulation. Tob Control;23(Suppl 3):iii3-9.



Association for the Treatment of Tobacco Use and Dependence
 An organization of providers dedicated to the promotion of and increased access to evidence-based tobacco treatment for the tobacco user.

www.attud.org
