

OREGON PUBLIC HEALTH DIVISION • OREGON HEALTH AUTHORITY

E-CIGARETTES: SMOKELESS DOES NOT MEAN HARMLESS

"Giving up smoking is the easiest thing in the world. I know because I've done it thousands of times."

—Mark Twain*

'Tis the season for resolutions of a life better-lived. What will 2014 hold for those who've resolved to make this the year they quit smoking for good? And what will you tell patients who say they plan to keep their resolution by trading in their cigarettes for e-cigarettes? In this issue of the *CD Summary*, we explore what we know and what we don't know about e-cigarettes, along with the health and policy implications of their sale and use.

WHAT THEY ARE

E-cigarettes, or electronic cigarettes, are devices that allow users to mimic the act of smoking cigarettes while inhaling nicotine. Instead of smoke from burning tobacco, users inhale vapor consisting of nicotine, flavor additives and other chemicals. When users inhale from the end of an e-cigarette, a battery operated device heats a liquid solution into a vapor (Image).¹

Today, e-cigarettes come in hundreds of varieties, including: rechargeable and disposable models; shapes mimicking common products, such as flash drives, pens, and lipstick; and candy and fruit flavors.

WHAT WE KNOW

Patterns of use.

We know that e-cigarettes contain nicotine, which is addictive.

We know that e-cigarette use has increased substantially among kids and adults over the past several years:

- Data analyzed by the Centers for Disease Control and Prevention (CDC) show that the number of adult Americans who have ever used e-cigarettes quadrupled from 2009 to 2010.²
- CDC data from the National Youth Tobacco Survey show that e-cigarette use doubled among U.S. middle and high school students during 2011–2012.³

- In Oregon, current e-cigarette use among 11th grade students rose from 2 percent to 5 percent from 2011 to 2013, even as current cigarette use continued to decline (Figure).
- OHT data also show that >50% of current e-cigarette users in middle school and high school in Oregon are not conventional cigarette smokers. Given that age 12 to 26 years is the time during which tobacco use is initiated,⁴ the kids using e-cigarettes alone are being introduced, and possibly addicted, to nicotine through a new method, and those who are using e-cigarettes with cigarettes are likely reinforcing their addiction to nicotine.
- Recent data also raise the concern that e-cigarettes are contributing to relapse among former smokers.^{2,5,6}

Image. Anatomy of an e-cigarette.



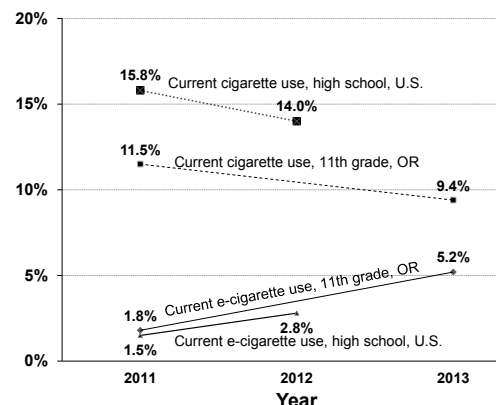
Source: www.legacyforhealth.org/content/download/582/6926/file/LEG-FactSheet-eCigarettes-JUNE2013.pdf

Available evidence indicates that a substantial portion of e-cigarette users of all ages use cigarettes at the same time.⁷ This 'dual use' pattern raises the concern that e-cigarettes are being used as a 'bridge product', bridging smokers from one cigarette to the next by providing nicotine in places where they can't smoke. This pattern suggests that e-cigarettes are being used to perpetuate nicotine addiction rather than break it.

Regulation.

We know that e-cigarettes are largely unregulated, as the Food and Drug Administration (FDA) has not yet used its authority to regulate e-cigarettes as tobacco products. One consequence is that we don't know how much nicotine e-cigarettes deliver, how consistently they deliver it, or if it is packaged safely. Without safety protections,

Figure. Current e-cigarette and cigarette use** among high school students, OR and US, 2011–2013



**Use ≥ once in the past 30 days. OR data: OHT; U.S. data: National Youth Tobacco Survey.

standards for product consistency, or truth-in-labeling requirements, two e-cigarettes produced on the same line can be dramatically different. From 2011–2013, the Oregon Poison Center received 31 calls related to unintended exposure or over-exposure to nicotine from e-cigarettes.

In addition, the FDA states that e-cigarettes "may contain ingredients that are known to be toxic to humans." The FDA has analyzed samples of e-cigarettes and found known carcinogens, and detectable levels of other toxic chemicals.[†] The University of California, San Francisco conducted an assessment of recent studies and concluded that benzene, cadmium, isoprene, lead, nickel, formaldehyde, acetaldehyde, and toluene are present in many brands of e-cigarettes.⁸

Appeal to kids.

A lack of regulation means that, in Oregon, kids can legally buy e-cigarettes at any age. Addressing age requirements for e-cigarette purchases will therefore be important, but it won't be enough by itself to keep kids from using e-cigarettes. In fact, in Utah, where age restrictions for e-cigarette purchase and use have been in place since 2010, e-cigarette use continues to rise among kids.⁹

† In 2009, the FDA analyzed 18 electronic cigarette cartridges and found that half of the vapor samples contained carcinogens, and that one contained diethylene glycol, a toxic chemical used in antifreeze. (See www.fda.gov/newsevents/publichealthfocus/ucm173146.htm)

* www.brainyquote.com/quotes/quotes/m/marktwain128157.html

If you need this material in an alternate format, call us at 971-673-1111.

IF YOU WOULD PREFER to have your *CD Summary* delivered by e-mail, zap your request to cd.summary@state.or.us. Please include your full name and mailing address (not just your e-mail address), so that we can purge you from our print mailing list, thereby saving trees, taxpayer dollars, postal worker injuries, etc.

We know that marketing, flavors, and low prices attract kids to tobacco products and need to be addressed if we want to keep kids from using e-cigarettes.^{10,11} Currently, e-cigarettes are available in a wide variety of flavors too numerous to list, but they include a number of kid-friendly options, such as strawberry, chocolate, mint, Cap'n Crunch®, and Gummi Bear®. Unlike cigarettes, e-cigarettes are legally advertised on television, with celebrities encouraging consumers to use e-cigarettes as a way to 'take their freedom back'. Furthermore, while local businesses and governments in Oregon have the authority to regulate e-cigarette sale and use, e-cigarettes can still be legally used in many places cigarettes can't. That offers an opportunity for smoking behavior to be modeled for kids as something that's normal, anywhere, any time.

Together, what we know about e-cigarettes raises the concern that they may: have an adverse impact on users' health; encourage smoking initiation through modeling and nicotine addiction; perpetuate the use of nicotine and tobacco products among tobacco users who might otherwise quit; and even those who have quit; and counter the effectiveness of smoke-free policies.

WHAT WE DON'T KNOW

What we don't know is if e-cigarettes will offer any benefits that can be weighed against the concerns raised above. E-cigarette advocates have promoted these products as smoking cessation tools, although little evidence exists that they are effective cessation aids.^{7,12,13} Still, some hold out hope that e-cigarettes offer an opportunity for harm reduction.^{14,15} However, supporters don't offer any example of an effective harm reduction strategy that includes televised celebrity endorse-

ments, promotion of recreational use, or sales at the mall kiosk and on the Internet. In fact, there is broad agreement that sensible regulation of e-cigarettes is needed, irrespective of one's view on their potential for harm reduction.

So what would sensible regulation look like? Quite simply, it would look like regulation for tobacco and include:

- FDA oversight
- No sales to kids
- No flavors, as flavors attract kids
- Prices high enough so kids can't afford to buy e-cigarettes
- No use where smoking is prohibited to avoid modeling of smoking for kids
- Advertising restrictions consistent with other tobacco products so their use isn't glamorized for kids

WHAT TO TELL PATIENTS

If patients ask about e-cigarettes, they should know that we don't know enough about what they do, potential long-term harms, or product safety.

What we do know is that there are 7 FDA-approved medications that are tested and known to be safe and effective at helping people quit smoking. Patients should also know there is a toll-free quit line (800-QUIT NOW) they can use to improve their chances of successfully quitting. With the right support, we know how to help people quit tobacco use.

REFERENCES

1. U.S. Food and Drug Admin. FDA Warns of Health Risks Posed by E-Cigarettes (2009), available at www.fda.gov/downloads/ForConsumers/ConsumerUpdates/UCM173430.pdf
2. Regan AK et al. Electronic nicotine delivery systems: adult use and awareness of the 'e-cigarette' in the USA. *Tob Control* 2013;22:19–23.
3. Centers for Disease Control and Prevention (CDC). Electronic Cigarette Use Among Middle and High School Students — United States, 2011–2012. *MMWR* 2013;62:729–30.

4. U.S. Department of Health and Human Services (DHHS). Preventing Tobacco Use Among Youth and Young Adults: A Report of the Surgeon General. Atlanta, GA: U.S. DHSS, CDC, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2012.
5. King BA et al. Awareness and ever-use of electronic cigarettes among U.S. adults, 2010–2011. *Nicotine Tob Res* 2013;15:1623–7.
6. McMillen R, Maduka J, and Winickoff J. Use of emerging tobacco products in the United States. *J Environ Public Health* 2012. See: www.hindawi.com/journals/jep/2012/989474/
7. Grana R, Benowitz N, Glantz SA. Background paper on e-cigarettes (Electronic Nicotine Delivery Systems). December 2013. See: http://nicotinepolicy.net/documents/position_papers/Grana_Glantz_WHO_ENDS_Report_Dec2013.pdf. (Accessed: 8 Jan 2014).
8. Center for Tobacco Control, Research and Education, Univ of California, San Francisco. www.tobacco.ucsf.edu/10-chemicals-identified-so-far-e-cig-vapor-are-california-prop-65-list-carcinogens-and-reproductive
9. Utah Health Status Update: Electronic cigarette use among Utah students (Grades 8, 10, and 12) and adults. December 2013. See: http://health.utah.gov/opha/publications/hsu/1312_ECig.pdf. (Accessed 9 Jan 2014).
10. Wilson LM et al. Impact of tobacco control interventions on smoking initiation, and prevalence: A systematic review. *J Environ and Public Health*; see: www.hindawi.com/journals/jep/2012/961724/.
11. King BA et al. Flavored-little-cigar and flavored-cigarette use among U.S. middle and high school students. *J of Adolescent Health* 2014;54:40–6.
12. Bullen C et al. Electronic cigarettes for smoking cessation: A randomised controlled trial. *Lancet* 2013;382:1629–37.
13. The Medical Letter on Drugs and Therapeutics. Electronic Cigarettes. *J Am Med Assoc* 2014;311:195.
14. Fairchild A, Colgrove J. The case for tolerating e-cigarettes. *New York Times* 2013. See www.nytimes.com/2013/12/09/opinion/the-case-for-tolerating-e-cigarettes.html?hp&rref=opinion
15. Fairchild AL, Bayer R, Colgrove J. The renormalization of smoking? E-cigarettes and the tobacco "end-game". *N Eng J Med* www.nejm.org/doi/full/10.1056/NEJMp1313940 (Accessed 7 Jan 2014).

The **CD Summary** (ISSN 0744-7035) is published fortnightly free of charge, by the Oregon Health Authority, Public Health Division, 800 NE Oregon St., Portland, OR 97232

Periodicals postage paid at Portland, Oregon.

Postmaster—send address changes to:

CD Summary, 800 NE Oregon St., Suite 730, Portland, OR 97232



CD SUMMARY

PERIODICALS
POSTAGE

PAID

Portland, Oregon

If you need this material in
an alternate format, call us
at 971-673-1111.

If you would prefer to have your *CD Summary* delivered by e-mail, zap your request to cd.summary@state.or.us. Please include your full name and mailing address (not just your e-mail address), so that we can purge you from our print mailing list, thereby saving trees, taxpayer dollars, postal worker injuries, etc.
