

Emerging Tobacco Products

Lucinda England MD, MSPH

Office on Smoking and Health

Centers for Disease Control and Prevention

Maryland State Council on Cancer Control Cancer Conference

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The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention

Centers for Disease Control and Prevention

Office on Smoking and Health



Context: Burned Tobacco is Still a Problem



“The burden of death and disease from tobacco use in the United States is overwhelmingly caused by cigarettes and other combusted tobacco products; rapid elimination of their use will dramatically reduce this burden.”





The health consequences of smoking – 50 years of progress: a report of the Surgeon General. – Atlanta, GA. : U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health, 2014.

Overview

- 1 What are emerging tobacco products?
- 2 Who is using emerging products?
- 3 What are health risks of emerging products?
- 4 Which policy approaches are appropriate for emerging products?

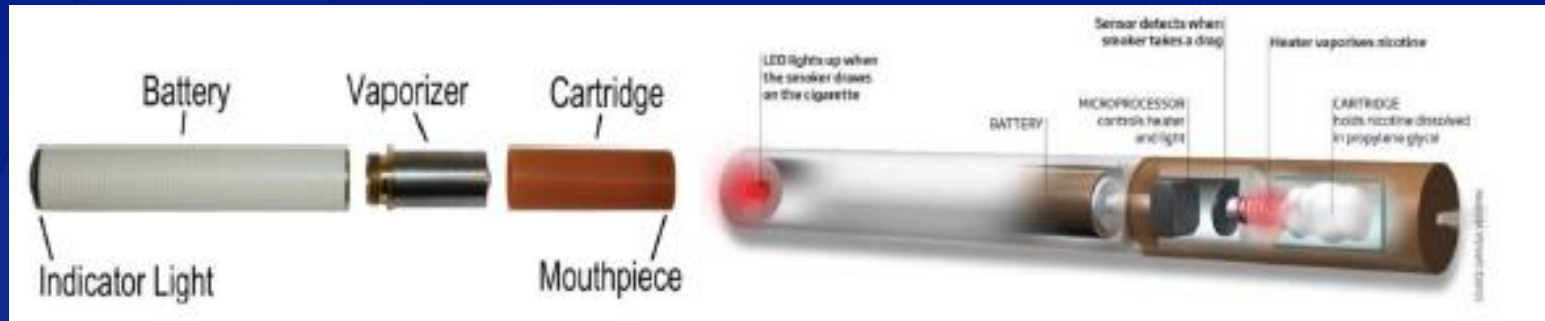
What Are ENDS?

Electronic Cigarettes and Vaping Devices

Product	Description	Some Brands
Disposable e-cigarette 	Cigarette-shaped device consisting of a battery and a cartridge containing an atomizer to heat a solution (with or without nicotine). Not rechargeable or refillable and is intended to be discarded after product stops producing aerosol. Sometimes called an e-hookah.	NJOY OneJoy, Aer Disposable, Flavorvapes
Rechargeable e-cigarette 	Cigarette-shaped device consisting of a battery that connects to an atomizer used to heat a solution typically containing nicotine. Often contains an element that regulates puff duration and /or how many puffs may be taken consecutively.	Blu, GreenSmoke, EonSmoke
Pen-style, medium-sized rechargeable e-cigarette 	Larger than a cigarette, often with a higher capacity battery, may contain a prefilled cartridge or a refillable cartridge (often called a clearomizer). These devices often come with a manual switch allowing to regulate length and frequency of puffs.	Vapor King Storm, Totally Wicked Tornado
Tank-style, large-sized rechargeable e-cigarette 	Much larger than a cigarette with a higher capacity battery and typically contains a large, refillable cartridge. Often contains manual switches and a battery casing for customizing battery capacity. Can be easily modified.	Volcano Lavatube

ENDS

- ❑ Delivers nicotine-containing aerosol by heating a solution (typically propylene glycol or glycerol/ glycerin nicotine, and flavoring agents, and other additives)
- ❑ Long-term health effects of inhaled propylene glycol and glycerin are unknown



Hutzler, Paschke, Kruschinski, et al. Chemical hazards present in liquids and vapors of electronic cigarettes. Arch Toxicol 2014

ENDS Aerosol is not *“Harmless Water Vapor”*

- ❑ Nicotine: 0-36 mg/ml
- ❑ Flavorings/additives often not disclosed
- ❑ Some analyses show presence of potentially allergenic compounds such as cinnamic aldehyde (highly toxic to human embryonic stem cells)
- ❑ Overheating could lead to production of carcinogens, such as formaldehyde, acetaldehyde, acrolein

Bhatnagar et al. Electronic cigarettes: a policy statement from the American Heart Association. *Circulation*. 2014;130:1418-36.

Behar, Davis, Wang, et al. Identification of toxicants in cinnamon flavored electronic cigarette refill fluids. *Toxicology in vitro* 2014.

Hutzler, Paschke, Kruschinski, et al. Chemical hazards present in liquids and vapors of electronic cigarettes. *Arch Toxicol* 2014



ENDS Other Purposes

- Some ENDS can be used to deliver other substances, like marijuana and caffeine



Lehigh Vapor
484-429-6978

Blog About Us
Home Liquid A

Caffeitine

A line of eLiquid that added pure extract caffeine to the traditional nicotine based liquid blend version and that of a pure caffeine, no nicotine version for customers to choose from. Caffeitine US trademark registration pending.

WARNINGS:

This image is a screenshot of a website for 'Lehigh Vapor'. It features a logo with a red and grey stylized 'L' and the text 'Lehigh Vapor' and '484-429-6978'. Navigation links for 'Blog', 'About Us', 'Home', and 'Liquid' are visible. The main heading is 'Caffeitine', followed by a description of the product and a 'WARNINGS:' section.



ENDS As Cessation Devices

Not Approved as a Cessation Device Center for Drug Evaluation and Research

- ❑ In 8 years companies have not approached FDA for approval



Original Article

Electronic Cigarette Use Among Patients With Cancer

Characteristics of Electronic Cigarette Users and Their Smoking Cessation Outcomes

Sarah P. Borderud, MPH¹; Yuelin Li, PhD¹; Jack E. Burkhalter, PhD¹; Christine E. Sheffer, PhD²; and Jamie S. Ostroff, PhD^{1*}

BACKGROUND: Given that continued smoking after a cancer diagnosis increases the risk of adverse health outcomes, patients with cancer are strongly advised to quit. Despite a current lack of evidence regarding their safety and effectiveness as a cessation tool, electronic cigarettes (E-cigarettes) are becoming increasingly popular. To guide oncologists' communication with their patients about E-cigarette use, this article provides what to the authors' knowledge is the first published clinical data regarding E-cigarette use and cessation outcomes among patients with cancer. **METHODS:** A total of 1074 participants included smokers (patients with cancer) who recently enrolled in a tobacco treatment program at a comprehensive cancer center. Standard demographic, tobacco use history, and follow-up cessation outcomes were assessed. **RESULTS:** A 3-fold increase in E-cigarette use was observed from 2012 to 2013 (10.6% vs 38.5%). E-cigarette users were more nicotine dependent than nonusers, had more prior quit attempts, and were more likely to be diagnosed with thoracic and head or neck cancers. Using a complete case analysis, E-cigarette users were as likely to be smoking at the time of follow-up as nonusers (odds ratio, 1.0; 95% confidence interval, 0.5-1.7). Using an intention-to-treat analysis, E-cigarette users were twice as likely to be smoking at the time of follow-up as nonusers (odds ratio, 2.0; 95% confidence interval, 1.2-3.3). **CONCLUSIONS:** The high rate of E-cigarette use observed is consistent with recent articles highlighting increased E-cigarette use in the general population. The current longitudinal findings raise doubts concerning the usefulness of E-cigarettes for facilitating smoking cessation among patients with cancer. Further research is needed to evaluate the safety and efficacy of E-cigarettes as a cessation treatment for patients with cancer. *Cancer* 2014;000:000-000. © 2014 American Cancer Society.

Borderud, S. P., Li, Y., Burkhalter, J. E., Sheffer, C. E. and Ostroff, J. S. (2014), Electronic cigarette use among patients with cancer: Characteristics of electronic cigarette users and their smoking cessation outcomes. *Cancer*. doi: 10.1002/cncr.28811

ENDS and Cessation

Table 2. Population Studies of the Association Between E-Cigarette Use and Cessation of Conventional Cigarette Smoking

Study	Location and Study Design	Odds of Quitting (95% CI)
Longitudinal studies		
Adkison et al ⁴ (2013)	US, UK, Canada, Australia (ITC), surveyed, 1 y apart	0.81 (0.43–1.53)*
Vickerman et al ⁸⁰ (2013)	US quit-line callers from 6 states surveyed at enrollment and 7 mo later	0.50 (0.40–0.63)†
Grana et al ⁷⁹ (2014)	US sample drawn from a nationally representative Internet panel, 1 y apart	0.76 (0.36–1.60)
Choi and Forster ⁸¹ (2014)	Midwestern young adults, 1 y apart	0.93 (0.19–4.63)
Cross-sectional study		
Popova and Ling ⁸² (2013)	US sample drawn from a nationally represented Internet panel	0.69 (0.52–0.94) *
All studies		
Pooled‡		0.61 (0.50–0.75)

CI indicates confidence interval; E-cigarette, electronic cigarette; and ITC, International Tobacco Control.

*Odds ratios obtained by contacting authors.

†Computed by authors of this report on the basis of the numbers reported.

‡Estimated with a random-effects meta-analysis using Stata 12.1 metan. There was no evidence of heterogeneity ($P=0.28$) or evidence of publication bias with the use of a funnel plot.

Grana, Benowitz, Glantz. E-cigarettes: a scientific review. *Circulation* 2014;129:1972-86.

Cessation: Randomized Trials

- 2 trials conducted with control arms
 - Caponnetto et al., 2013 (3 e-cigarette arms)
 - Participants not interested in quitting
 - All arms reduced cigs/day, no difference in quits
 - Bullen et al., 2013
 - Participants wanted to quit
 - Nicotine e-cigarette, zero nicotine e-cigarette, NRT patch
 - 6 month follow-up
 - 50% reduction cigs/day (57%, 45%, 41%, $p=0.08$)
 - Quitting 7.3%, 4.1%, 5.8% ($p=0.5$)

Cessation in cancer patients

Borderud et al, 2014

- **Patients presenting to Memorial Sloan Kettering Cancer Center 2012-2013 screened for tobacco use, users referred to Tobacco Cessation Program (n=4504)**
- **Those willing to enroll in treatment program included in study (n=1074)**
 - **Assessed for e-cigarette use**
 - **Follow up at 6-12 months for cessation status (n=414)**
- **Findings:**
 - **26% reported past 30 day use of e-cigarettes at baseline; 92% of e-cigarette users were also smoking.**
 - **Quarterly prevalence increased from 10.6% to 38.5%**

Cessation in cancer patients

Continued

❑ E-cigarette users :

- Smoked more cigarettes/day
- Reported higher nicotine dependence scores
- Had more frequent and longer duration of prior quit attempts
- No difference in quitting motivation or confidence

❑ At follow up:

- 7-day point prevalence of smoking abstinence was no different in e-cigarette users and non-users (44.4% vs. 43.1%).
- E-cigarette users were less likely to have been abstinent for > 24 hrs
- After adjustment, e-cigarette users as likely to be smoking at follow up as non-users.

Marketing

ENDS Advertising Expenditures across media markets

- ❑ 2011: \$6.4 million**
- ❑ 2012: \$18.3 million**
- ❑ 2013: >\$80 million**

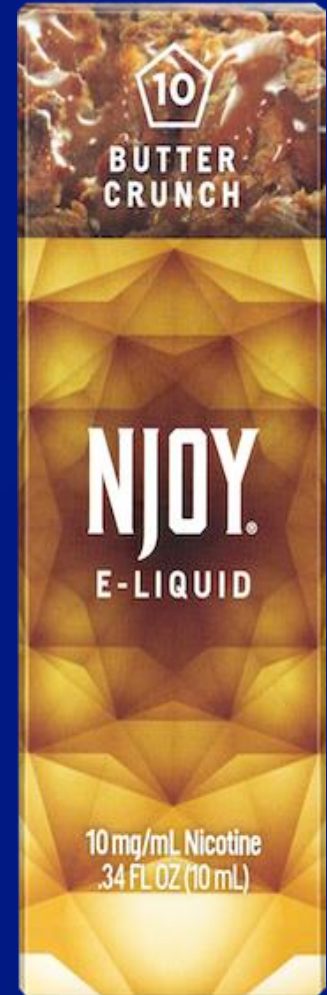
Celebrity spokespeople



Glamorous women



Hundreds of flavors



Use in smoke-free areas

Smoke Anywhere

Smoke when and where you want.



Dj HeavyGrinder

[Learn More](#) ▶

Cheaper price

Smoking Everywhere E-Cigarette is cheaper than smoking real ci



CHEAPER

Smoking Everywhere
chemicals like tradition
like a real cigarette, fe
cigarette... It also may

A pack of Metro Electronic Cigarettes (Chick Stick) and a single e-cigarette. The pack is pink and silver, with a green diagonal banner that says '1.8% MENTHOL'. The e-cigarette is pink with a green band. Text next to the pack states 'each e-cig is = ABOUT 3 PACKS OF CIGARETTES'.

Slide courtesy Pam Ling, UCSF

Social networking

Blu e-Cigs finally launches new 'Smart Pack' for social smoking, tweakable nicotine intake



THE LATEST SUPERSMOKER

BLUETOOTH

World first! In 2007, we introduced the first electronic cigarette in the world; 7 years later, we are changing the world of electronic smoking for good with the first Supersmoker that can be used to make calls and receive via Bluetooth and play music via the built-in microphone!



Placement Next to Candy



<http://www.countertobacco.org/news/2014/09/12/njoy-brags-about-e-cigarette-placement-among-candy>



Health Claims

New research on the dangers of smoking to young women and their unborn babies can send chills down any woman's spine. We now have several more compelling reasons to help women realize how important it is to quit smoking or switch to e-cigarettes - ideally **e-cigarettes with no nicotine**.



Quitting smoking at any point during pregnancy reduces the chance of complications. Of course, the sooner, the better!



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FORTIFIED ELECTRONIC CIGARETTES

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SAY GOOD-BYE TO SLEEPLESS NIGHTS

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Slide courtesy Pam Ling, UCSF

Physician Endorsement



What tactics lead to youth smoking?

- **Exposure to ads**
- **Themes in advertising that resonate with youth**
- **Low prices and price-reducing promotions**
- **Ease of access to a product**
- **Candy and fruit-flavored products**
- **Health claims**
- **Products that are easier to use**

Preventing Tobacco Use Among Youth and Young Adults

A Report of the Surgeon General

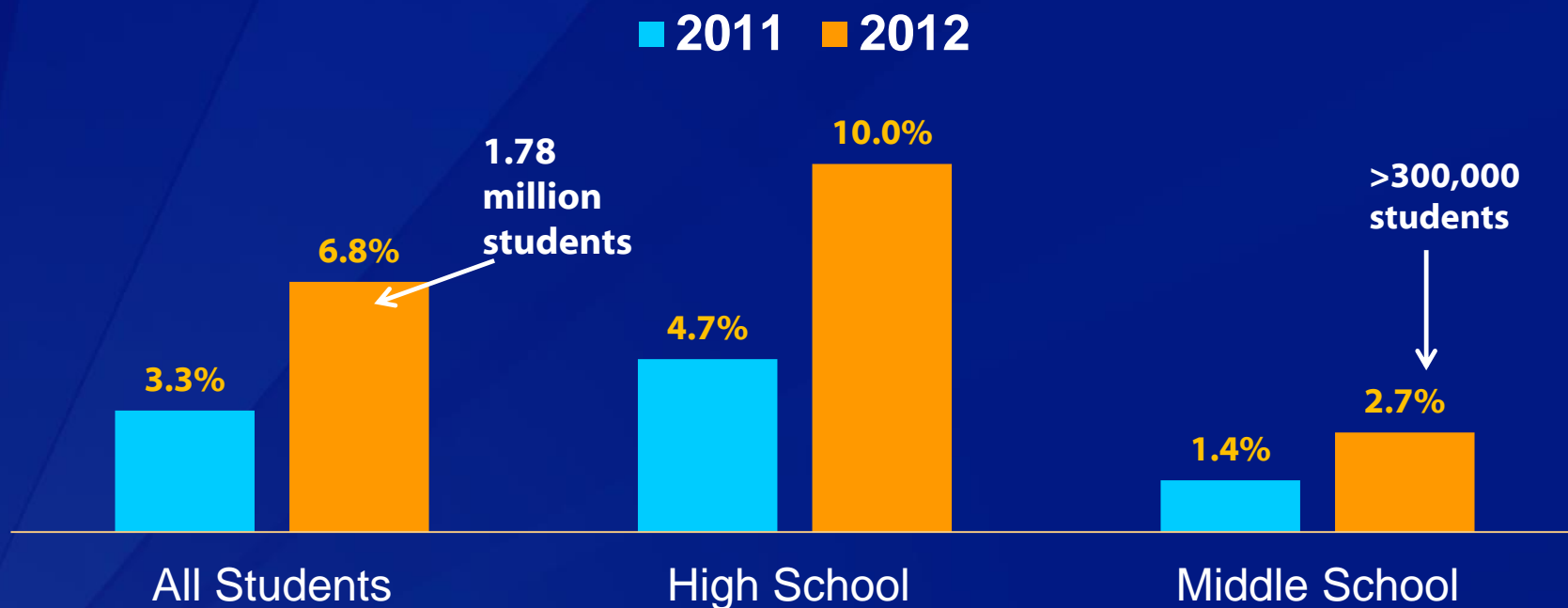


U.S. Department of Health and Human Services

Trends in Use

E-cigarette ever use more than doubled* between 2011 and 2012 among students

Youth E-cigarette Ever Use, National Youth Tobacco Survey, United States

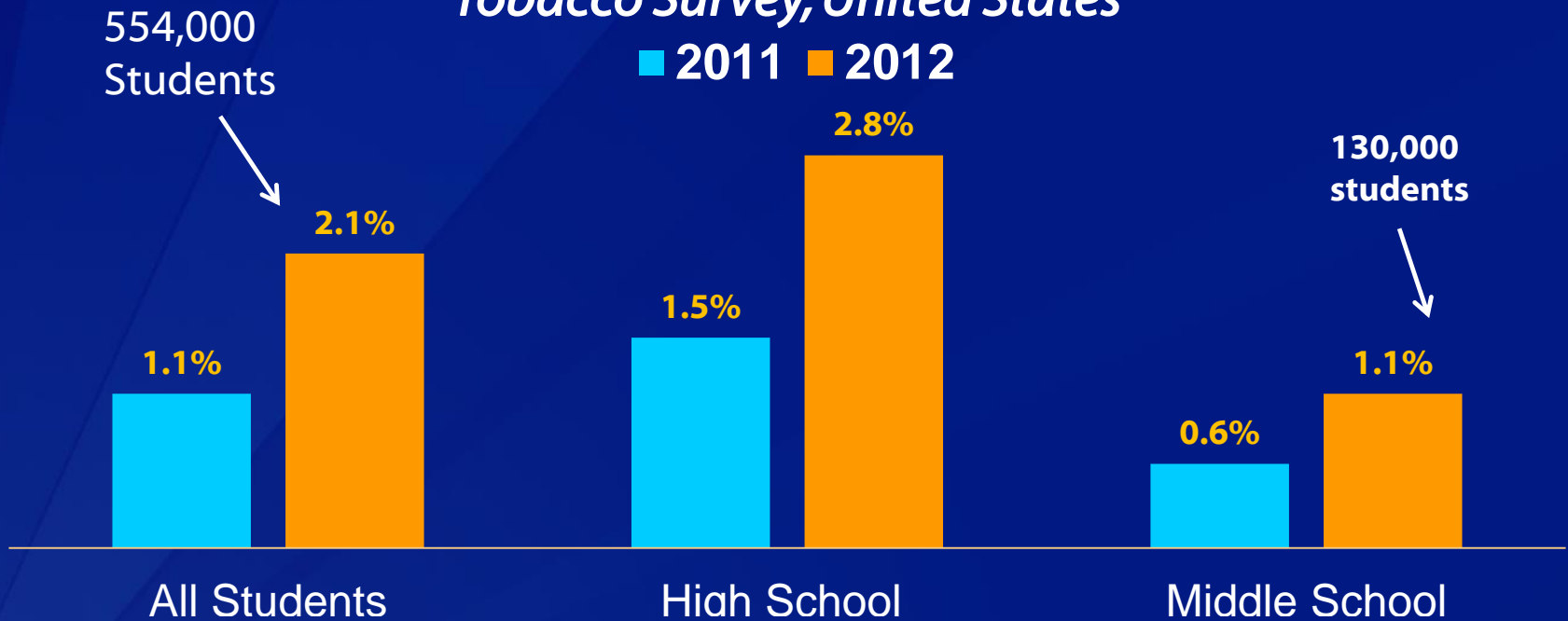


*Statistically different ($p < 0.05$)

Centers for Disease Control and Prevention (2013). "Notes from the Field: Electronic Cigarette Use Among Middle and High School Students — United States, 2011–2012." *Morbidity and Mortality Weekly Report* 62(35): 729-730.

Current e-cigarette use among students more than doubled between 2011 and 2012

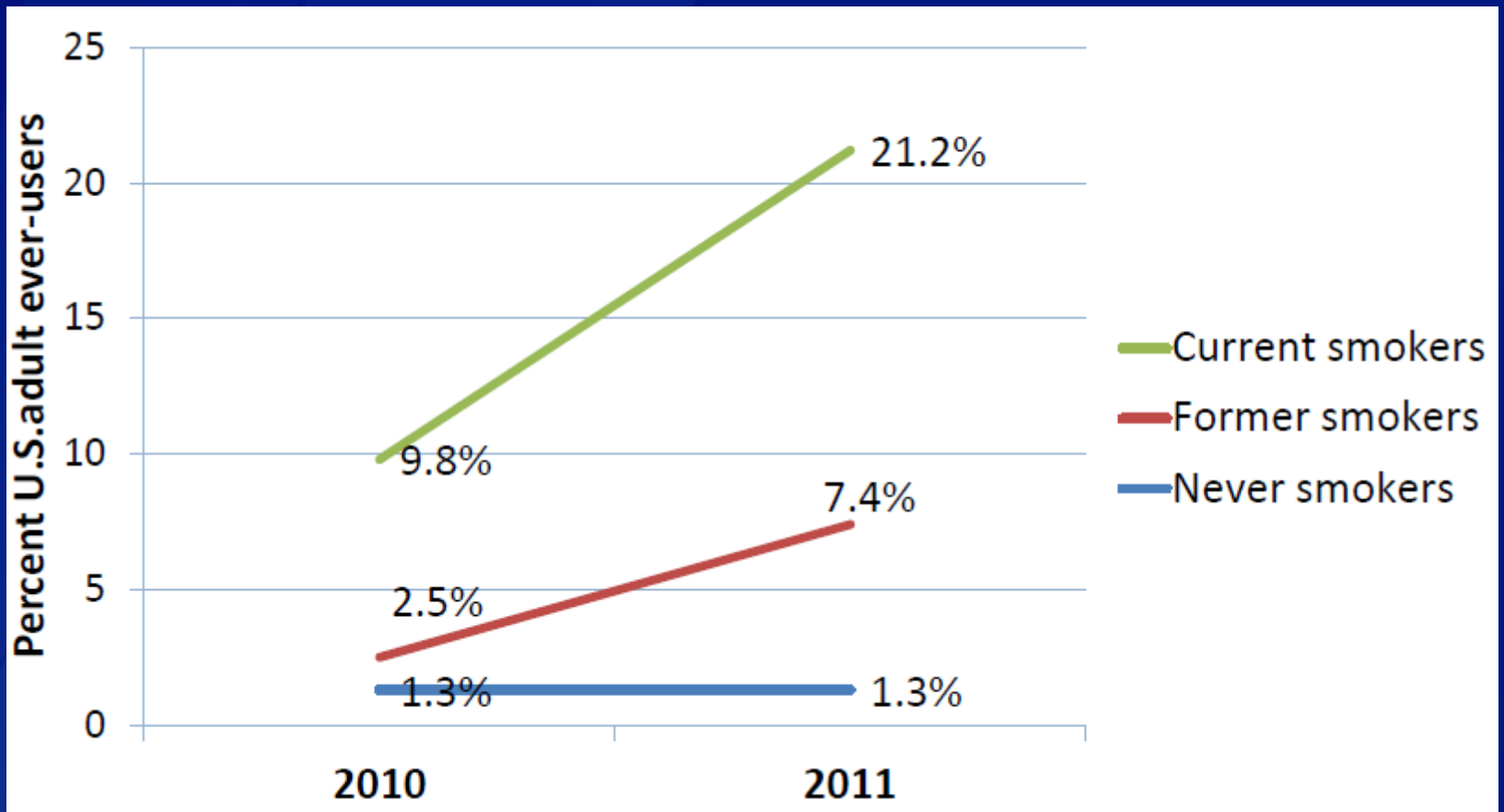
Current E-Cigarette Use, National Youth Tobacco Survey, United States*



* Current use is defined as use on one or more days in the last 30 days

Centers for Disease Control and Prevention (2013). "Notes from the Field: Electronic Cigarette Use Among Middle and High School Students — United States, 2011–2012." *Morbidity and Mortality Weekly Report* 62(35): 729-730.

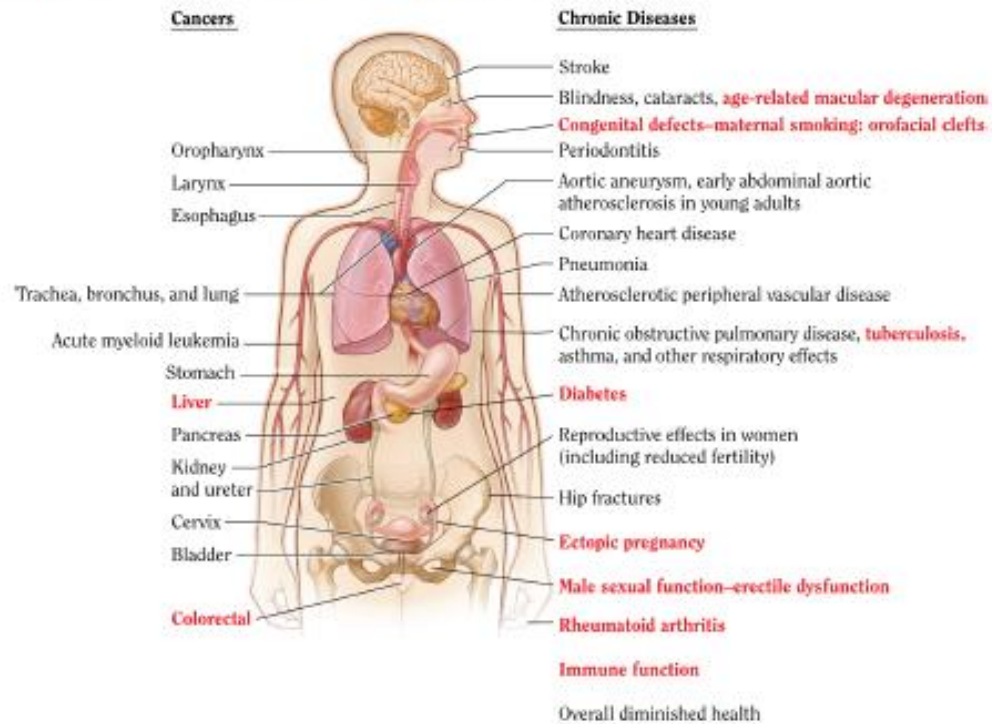
E-Cigarette Ever Use 2010-2011



Health Effects

Surgeon General's Report

Figure 1A The health consequences causally linked to smoking



Source: USDHHS 2004, 2006, 2012.

Note: The condition in red is a new disease that has been causally linked to smoking in this report.

ENDS Potential for Harm

❑ Direct harm

- ❑ Expose children and adolescents, pregnant women, and non-smokers to 2nd hand aerosol, nicotine
- ❑ Poisonings among users or non-users
- ❑ Uncertain health effects of long term exposure
 - ❑ Pulmonary delivery of propylene glycol, glycerin, nicotine
 - ❑ Lower toxin burden than cigarettes, but not water vapor



Nicotine

2014 Surgeon General's Report

1. At high enough doses, nicotine causes **acute toxicity**
2. Nicotine **activates** multiple biological pathways through which smoking increases risk for disease
3. Nicotine exposure during fetal development has lasting adverse consequences for **brain development**

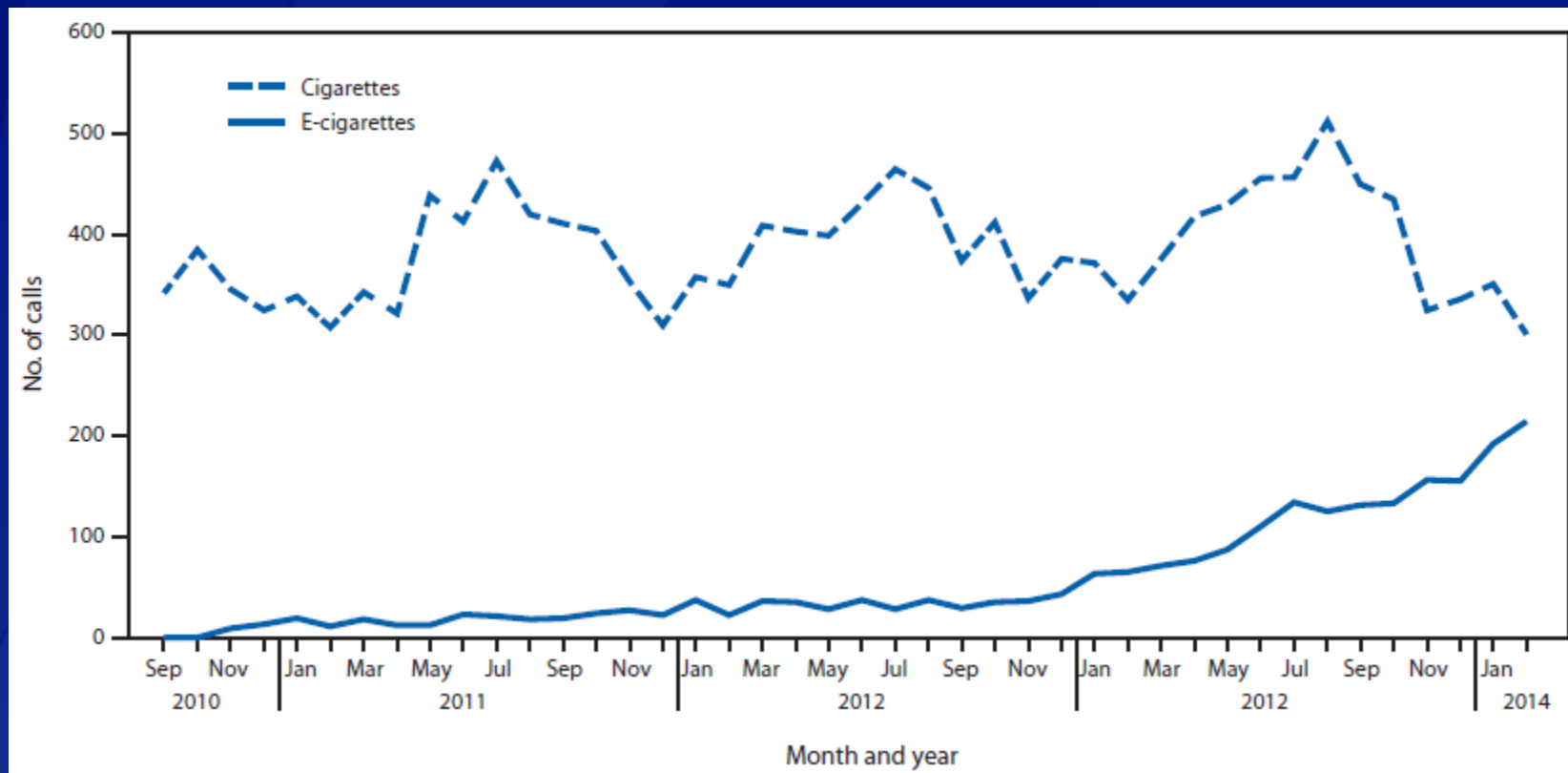


Nicotine

2014 Surgeon General's Report

4. Nicotine adversely affects maternal and fetal health during pregnancy, contributing to multiple adverse outcomes including **preterm delivery and stillbirth**
5. The evidence is suggestive that nicotine exposure during **adolescence** may have lasting adverse consequences for brain development
6. The evidence is inadequate to infer the presence or absence of a causal relationship between exposure to nicotine and risk for **cancer**.

Number of calls to poison centers for cigarette or e-cigarette exposures, by month — United States, September 2010–February 2014



ENDS Aerosol Second Hand Exposure

- **Use of e-cigarettes in the home or car could expose children/nonsmokers to nicotine, as well as to propylene glycol and/or glycerin, and other toxicants, through inhaled aerosolized vapor and surface deposits.**
 - Studies of third hand tobacco smoke found that smoke components, including nicotine, are deposited and reemitted from indoor surfaces over time, and can result in substantial nicotine exposure levels.
 - Nicotine from e-cigarettes also deposits on indoor surfaces, creating a reservoir of nicotine that could be ingested, absorbed transdermally, or inhaled by children.

Singer BC, Hodgson AT, Nazaroff WW (2003) Gas-phase organics in environmental tobacco smoke: 2. Exposure-relevant emission factors and indirect exposures from habitual smoking. *Atmos Environ* 2003;37:5551–5561.
Goniewicz ML, Lee L. Electronic cigarettes are a source of thirdhand exposure to nicotine. *Nicotine Tob Res* e-published August 30, 2014.

ENDS Aerosol Second Hand Exposure

Cigarettes vs. e-cigarettes: Passive exposure at home measured by means of airborne marker and biomarkers[☆]



Montse Ballbè^{a,b,c,d,e}, Jose M. Martínez-Sánchez^{a,c,f,*}, Xisca Sureda^{a,c,e}, Marcela Fu^{a,c,e}, Raúl Pérez-Ortuño^g, José A. Pascual^{g,h}, Esteve Saltó^{i,j}, Esteve Fernández^{a,b,c,e}

^a Tobacco Control Unit, Cancer Prevention and Control Program, Institut Català d'Oncologia, L'Hospitalet de Llobregat, Barcelona, Spain

^b Catalan Network of Smoke-free Hospitals, L'Hospitalet de Llobregat, Barcelona, Spain

^c Cancer Prevention and Control Group, Institut d'Investigació Biomèdica de Bellvitge – IDIBELL, L'Hospitalet de Llobregat, Barcelona, Spain

^d Addictions Unit, Institute of Neurosciences, Hospital Clínic de Barcelona – IDIBAPS, Barcelona, Spain

^e Department of Clinical Sciences, Universitat de Barcelona, Barcelona, Spain

^f Biostatistics Unit, Department of Basic Sciences, Universitat Internacional de Catalunya, Sant Cugat del Vallès, Barcelona, Spain

^g IMIM (Hospital del Mar Medical Research Institute), Barcelona, Spain

^h Department of Experimental and Life Sciences, Universitat Pompeu Fabra, Barcelona, Spain

ⁱ Health Plan Directorate, Ministry of Health, Generalitat de Catalunya, Spain

^j Department of Public Health, Universitat de Barcelona, Barcelona, Spain

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ABSTRACT

Background: There is scarce evidence about passive exposure to the vapour released or exhaled from electronic cigarettes (e-cigarettes) under real conditions. The aim of this study is to characterise passive exposure to nicotine from e-cigarettes' vapour and conventional cigarettes' smoke at home among non-smokers under real-use conditions.

Methods: We conducted an observational study with 54 non-smoker volunteers from different homes:

Montse Ballbè, Jose M. Martínez-Sánchez, Xisca Sureda, Marcela Fu, Raúl Pérez-Ortuño, José A. Pascual, Esteve Saltó, Esteve Fernández, Cigarettes vs. e-cigarettes: Passive exposure at home measured by means of airborne marker and biomarkers, *Environmental Research*, Volume 135, November 2014, Pages 76-80.

Potential Harmful Interaction with Cigarettes

- ❑ Glamorize and renormalize tobacco use**
- ❑ Lead to regular use of nicotine and/or use of cigarettes in youth or adult non-smokers**
- ❑ Delay quitting and/or diminish the chances a smoker will quit by leading to long-term dual use**
- ❑ Discourage smokers from using proven quit methods**
- ❑ Increase former smoker relapse**

ENDS Potential for Benefit

Only under two circumstances:

- ❑ Are completely substituted for all combusted tobacco products in established adult smokers who would otherwise continue smoking**
- ❑ Assist in rapid transition to a society with little or no use of burned products**

Dual Use

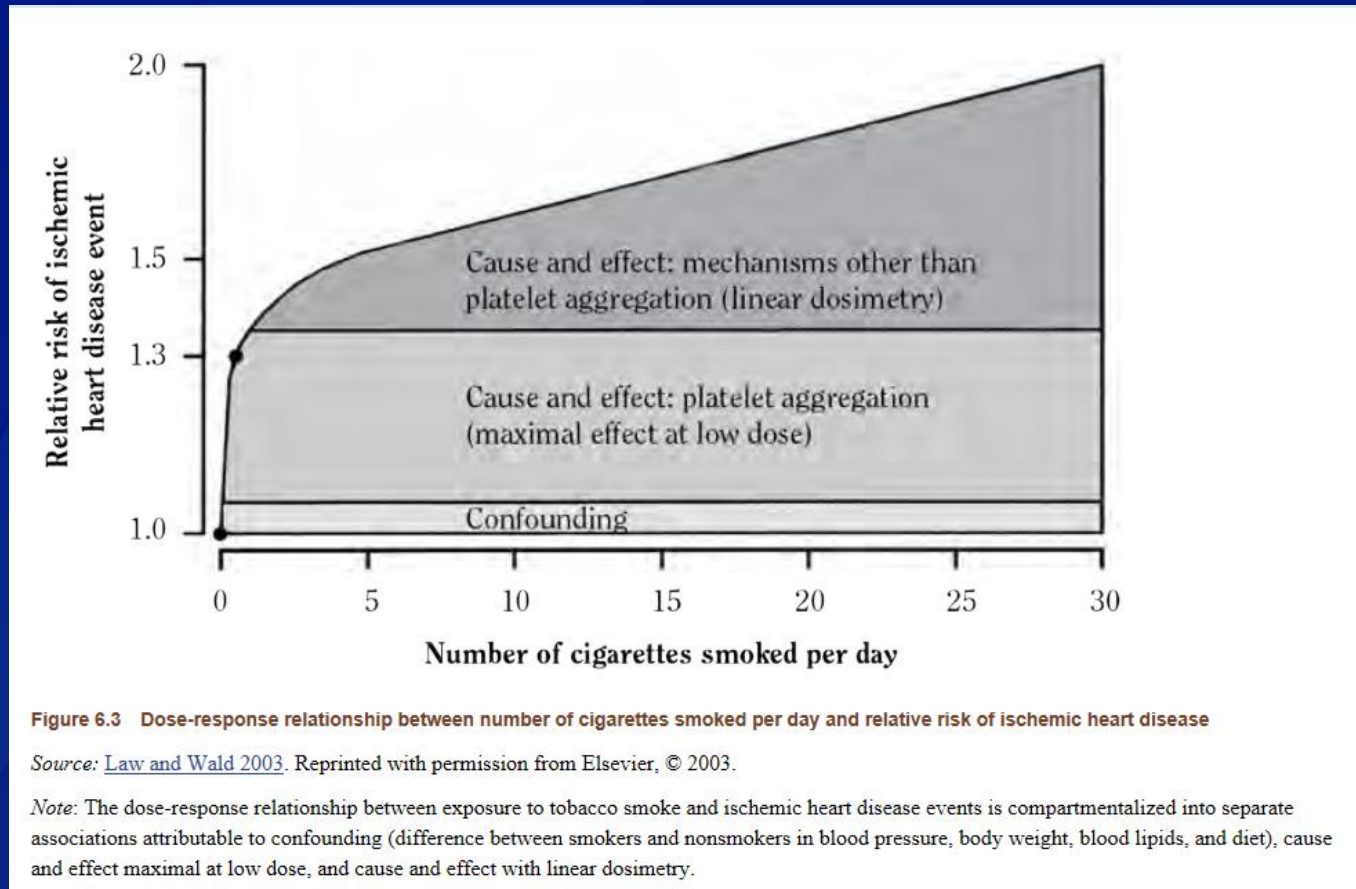
- ❑ **Most e-cigarette users are current or former smokers**
- ❑ **Smokers often begin using e-cigarettes to cut back or quit smoking and become dual users**
- ❑ **Cutting back on traditional cigarettes does not reduce risk of all-cause mortality**
- ❑ **Cutting back on traditional cigarettes does not reduce risk of CVD in a linear fashion**

U.S. Department of Health and Human Services. The Health Consequences of Smoking: 50 Years of Progress. A Report of the Surgeon General. Atlanta, Georgia. . U.S. Department of Health and Human Services , Centers for Disease Control and Prevention. Office on Smoking and Health 2014.

U.S. Department of Health and Human Services. How Tobacco Smoke Causes Disease: The Biology and behavioral Basis for Smoking Attributable Disease. A Report of the Surgeon General. Atlanta Georgia. U.S. Department of Health and Human Services , Centers for Disease Control and Prevention. Office on Smoking and Health 2010.

Bjartveit and Tverday. Health Consequences of smoking 1-4 cigarettes per day. Tobacco Control 2005.

Reducing smoking without quitting



U.S. Department of Health and Human Services. How Tobacco Smoke Causes Disease: The Biology and behavioral Basis for Smoking Attributable Disease. A Report of the Surgeon General. Atlanta Georgia. U.S. Department of Health and Human Services, Centers for Disease Control and Prevention. Office on Smoking and Health 2010.

Provider knowledge and beliefs

- ❑ **Statewide sample of physicians and NPs providing care to children 11-17 years of age in MN, 2013**
 - Self-reported knowledge about e-cigarettes
 - 18% “nothing at all”
 - 65% “a little”
 - Very or somewhat uncomfortable talking to patients: 53%
- ❑ **National survey of obstetricians/gynecologists 2012**
 - 14% e- cigarettes have no adverse effects during pregnancy
 - 2/3 wanted to know more about the potential health effects of noncombustible tobacco products;
 - Only 5% believed themselves to be fully informed

Pepper, McRee, and Gilkey. Health providers' beliefs and attitudes about electronic cigarettes and preventive counseling for adolescent patients. *Journal of Adolescent Health* 2014.

England LJ, Anderson BL, Tong VT, et al. Screening practices and attitudes of obstetricians-gynecologists toward new and emerging tobacco products. *Am J Obstet Gynecol.* 2014 May 29

Provider knowledge and beliefs

- ❑ **Random sample of NC physicians surveyed in 2013**
 - 48% reported that patients sometimes or frequently ask about e-cigarettes
 - 67% indicated that e-cigarettes are a helpful smoking cessation aid
 - 35% recommend e-cigarettes to their patients
 - 13% believed that e-cigarettes are approved by the FDA for smoking cessation

**What do existing
recommendations say?**

US Preventive Services Task Force

The screenshot shows the U.S. Preventive Services Task Force website. The header includes the logo, a search bar for 'Search USPSTF Topics', and options for 'E-mail Updates' and 'Text size'. The main navigation menu on the left lists: Home, Recommendations, Published Recommendations, Recommendations in Progress (highlighted), Information for Health Professionals, Information for Consumers, Public Comments and Nominations, Methods and Processes, About the USPSTF, Newsroom, and Announcements. The main content area is titled 'Recommendations in Progress' and includes a breadcrumb trail: 'You are here: Home >> Recommendations for Primary Care Practice >> Recommendations in Progress'. The text explains that topics are in review and development, and provides a diagram of the four stages of development. A yellow box titled 'Nominating a Topic' explains the process and includes a 'click here' link. The diagram shows four steps: Step 1: Develop a Research Plan (8 topics), Step 2: Systematically Review the Evidence (19 topics), Step 3: Develop a Draft Recommendation Statement (7 topics), and Step 4: Finalize the Recommendation Statement (1 topic). Below the diagram, the first step is detailed: 'Step 1: Research Plan Development' where an Evidence-based Practice Center (EPC) and the USPSTF create a research plan.

U.S. Preventive Services
TASK FORCE

Search USPSTF Topics Search

E-mail Updates Text size: a A A

You are here: [Home](#) >> [Recommendations for Primary Care Practice](#) >> [Recommendations in Progress](#)

Recommendations in Progress

The following topics are in review and development with the U.S. Preventive Services Task Force (Task Force). The purpose of a review is to update a recommendation based on new research or to add a new recommendation to the Task Force library.

Every recommendation involves several stages of development. The diagram below outlines the current stage for each topic now under review. The review process takes into account input from the medical and research community, stakeholders, and the general public.

The length of time for the entire recommendation process varies depending on the amount and type of available evidence and the time required for compilation of data into a draft recommendation, public comment periods and consideration of comments, and in-depth review and discussions among Task Force members.

Nominating a Topic

The USPSTF makes recommendations about three types of clinical preventive services: screening tests, preventive medications, and counseling. Recommendations on preventive services are made for asymptomatic people (people without signs and symptoms of the conditions targeted by the preventive services). For more information and to nominate a topic, [click here](#).

Stages of Development

Topics under review and development are listed below.

- Step 1: Develop a Research Plan** (8 topics)
- Step 2: Systematically Review the Evidence** (19 topics)
- Step 3: Develop a Draft Recommendation Statement** (7 topics)
- Step 4: Finalize the Recommendation Statement** (1 topic)

Step 1: Research Plan Development

Evidence-based Practice Center (EPC) and the USPSTF create a research plan that guides the recommendation process.

Topics Currently in this Stage

III. Contextual Questions

Contextual questions will not be systematically reviewed and are not shown in the Analytic Framework.

1. What is the efficacy and safety of electronic cigarettes as an aid for smoking cessation in current adult smokers?

North American Quitline Consortium

NAQC Issue Paper

NAQC's Issue Papers aim to provide critical knowledge on important quitline topics and guidance for decision making.

Integration of Tobacco Cessation Medications in State and Provincial Quitlines: A Review of the Evidence and the Practice with Recommendations (2014 Update)

Tobacco dependence treatment professionals, including quitlines, are struggling with how to address e-cigarette use in the context of cessation. In the absence of established best practices, quitlines are creating treatment protocols for counseling and medications delivery. In the fall 2014, NAQC will publish an evidence synthesis on the topic to address these important questions.

http://c.ymcdn.com/sites/www.naquitline.org/resource/resmgr/Issue_Papers/MedicationsUpdateIssuePaper.pdf

Other Recommendations

- American Heart Association
- Forum of International Respiratory Societies (FIRS)
- American Lung Association
- CDC (Division of Reproductive Health)
- International Association for the Study of Lung Cancer

Information for Health Care Providers and Public Health Professionals: Preventing Tobacco Use During Pregnancy



Box 1: CDC's Tips From Former Smokers

Watch or read real stories from mothers who quit smoking or whose children are affected by tobacco smoke at www.cdc.gov/tobacco/campaign/tips/

- Amanda tried hard to quit smoking while she was pregnant, but she was unable to overcome her addiction to cigarettes.
- Rebecca is a mother of two boys. She has no health problems but quit smoking with support from friends and family.
- Tiffany quit smoking because her mother died of cancer when Tiffany was 16. She could not bear the idea of missing out on her own daughter's life.
- Jessica never smoked but her son has severe asthma triggered by secondhand smoke exposure.

What are the health effects of tobacco use on pregnancy?

Smoking during pregnancy remains one of the most common preventable causes of pregnancy complications and of illness and death among infants. Women who quit smoking before or during pregnancy reduce their risk for poor pregnancy outcomes.

Compared with nonsmokers, women who smoke before pregnancy are about twice as likely to experience the following conditions:

- Premature
- Delay in conception
- Infertility
- Ectopic pregnancy
- Premature rupture of the membranes
- Placental abruption
- Placenta previa

Compared with babies born to nonsmokers, babies born to women who smoke during pregnancy are more likely to be:

- Premature
- Low birth weight
- Small for gestational age or fetal growth restricted
- Born with a cleft lip, or cleft palate, or both
- They are also more likely to die of SIDS (Sudden Infant Death Syndrome)

All tobacco products that are burned contain nicotine and carbon monoxide. These are harmful during pregnancy. These products include cigarettes, little cigars, cigars, and hookahs.

What is the prevalence of smoking before, during, and after pregnancy?

CDC's Pregnancy Risk Assessment Monitoring System (PRAMS) monitors the prevalence of smoking before, during, and after pregnancy based on a mother's self-report. In 2011, data from 24 states representing about 40% of US live births showed:

Before pregnancy

- About 23% of women smoked during the 3 months before pregnancy.

National Center for Chronic Disease Prevention and Health Promotion
Division of Reproductive Health



COMMENTARY

OPEN

E-Cigarettes and Cancer Patients

K. Michael Cummings, PhD, MPH, Carolyn M. Dresler, MD, MPA, John K. Field, PhD, FRCPath, Jesse Fox, MB ChB, MBA, Ellen R. Gritz, PhD, Nasser H. Hanna, MD, Norihiko Ikeda, MD, PhD, Jacek Jassem, MD, PhD, James L. Mulshine, MD, Matthew J. Peters, MD, FRACP, Nise H. Yamaguchi, MD, PhD, Graham Warren, MD, PhD, and Caicun Zhou, MD, PhD

The increasing popularity and availability of electronic cigarettes (i.e., e-cigarettes) in many countries have promoted debate among health professionals as to what to recommend to their patients who might be struggling to stop smoking or asking about e-cigarettes. In the absence of evidence-based guidelines for using e-cigarettes for smoking cessation, some health professionals have urged caution about recommending them due to the limited evidence of their safety and efficacy, while others have argued that e-cigarettes are obviously a better alternative to continued cigarette smoking and should be encouraged. The leadership of the International Association for the Study of Lung Cancer asked the Tobacco Control and Smoking Cessation Committee to formulate a statement on the use of e-cigarettes by cancer patients to help guide clinical practice. Below is this statement, which we will update periodically as new evidence becomes available.

Key Words: Electronic cigarette, Smoking cessation, Lung cancer.

(*J Thorac Oncol.* 2014;9: 438–441)

into the lungs.⁴ As a result, most people develop a strong long-lasting addiction to cigarettes, which makes it hard to avoid the repeated exposures to harmful smoke toxins.⁵

The adverse effects of smoking continue after a cancer diagnosis. Continued smoking increases the risk for treatment-related complications, recurrence, the development of a second primary cancer, and mortality from both cancer-related and non-cancer-related causes.^{6,8–11} The adverse effects of smoking are noted across cancer disease sites and affect treatment outcomes for surgery, chemotherapy, radiotherapy, and targeted therapy such as biological therapies. Several studies have demonstrated that smoking cessation at or following a cancer diagnosis can reverse the adverse effects of tobacco on cancer treatment outcomes.^{12–15}

Obviously, the best preventative measure to curb the adverse health effects associated with smoking is abstaining from smoking or tobacco cessation. Treatment-related guidelines are available to provide a foundation upon which to base

Circulation



Electronic Cigarettes: A Policy Statement From the American Heart Association
Arum Bhattacharjee, Lutz F. Witzel, Kurt M. Ribick, Chris Buller, Frank Chaloupka, Marwan R. Pano, Rose Marie Robertson, Timothy McAuley, David Geiff and Neal Benowitz on behalf of the American Heart Association Advocacy Coordinating Committee, Council on Cardiovascular and Stroke Nursing, Council on Clinical Cardiology, and Council on Quality of Care and Outcomes Research

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PULMONARY PERSPECTIVE



Electronic Cigarettes A Position Statement of the Forum of International Respiratory Societies

Dean E. Schraufnagel¹, Francesco Blasi², M. Bradley Drummond³, David G. L. Lam⁴, Ehsan Latif⁵, Mark J. Rosen⁶, Paul Sansone⁷, and Richard Van Zyl-Smit⁸, on behalf of the Forum of International Respiratory Societies¹
¹Hennepin County, St. Paul, and Hennepin County, Department of Medicine, University of Illinois at Chicago, Chicago, Illinois; ²Department of Pathophysiology and Transplantation, University of Milan, IRCCS Fondazione Cà Granda, Milano, Italy; ³University of California, San Diego, San Diego, California; ⁴Department of Respiratory Medicine, University of Hong Kong, Hong Kong SAR, China; ⁵Department of Tobacco Control, International Union Against Tuberculosis and Lung Disease-UK, Edinburgh, United Kingdom; ⁶American College of Chest Physicians, Glenview, Illinois; ⁷Department of Respiratory and Tuberculosis, EPIC, Instituto Nacional de Enfermedades Respiratorias, Ciudad de México, Mexico; and ⁸Division of Pulmonary and Critical Care Medicine, Department of Medicine, University of Cape Town, Cape Town, South Africa

Abstract

Awareness and usage of electronic cigarettes has exponentially increased during the last few years, especially among young people and women in some countries. The rapid acceptance of electronic cigarettes may be attributed in part to the perception created by marketing and the popular press that they are safer than combustible cigarettes.

Goals: To alert and advise policy makers about electronic cigarettes and their potential hazards.

Methods: Using the Union's position paper on electronic cigarettes as the starting template, the document was written using an iterative process. Portions of the manuscript have been taken directly from the position papers of participating societies.

Results: Because electronic cigarettes generate less tar and carcinogens than combustible cigarettes, use of electronic cigarettes may reduce disease caused by those components. However, the health risks of

electronic cigarettes have not been adequately studied. Studies looking at whether electronic cigarettes can aid smoking cessation have had inconsistent results. However, the availability of electronic cigarettes may have an overall adverse health impact by increasing initiation and reducing cessation of combustible nicotine delivery products.

Conclusions: The health and safety claims regarding electronic nicotine delivery devices should be subject to ordinary review. The potential benefits of electronic cigarettes to an individual smoker should be weighed against potential harm to the population of increased social acceptability of smoking and use of nicotine, the latter of which has addictive power and untoward effects. As a precaution, electronic nicotine delivery devices should be restricted or banned until more information about their safety is available. If they are allowed, they should be clearly registered as medicines or tobacco products.

Keywords: electronic cigarettes, nicotine delivery devices, tobacco products

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American Lung Association Statement on E-Cigarettes

The American Lung Association is very concerned about the potential health consequences of electronic cigarettes, as well as the unproven claims that they can be used to help smokers quit. There is presently no government oversight of these products and absent Food and Drug Administration (FDA) regulation, there is no way for the public health medical community or consumers to know what chemicals are contained in e-cigarettes or what the short and long term health implications might be. In [an extensive comments filed with the FDA in early August](#), the American Lung Association called on the Obama Administration to finalize its regulation to regulate e-cigarettes by the end of 2014.

The FDA has not approved any e-cigarette as a safe or effective method to help smokers quit, when smokers are ready to quit, they should call 1-800-QUIT NOW or talk with their doctors about using one of the seven FDA-approved medications proven to be safe and effective in helping smokers quit.

- About Smoking
- How To Quit
- Tobacco Control Advocacy
- Federal
- States & Communities
- Reports & Resources
- Lung Action Network
- Workplace Wellness
- Tobacco-Free Colleges and Universities

Regulation

State action on ENDS

- ❑ No sales to minors (34 states)
- ❑ No use where smoking is not allowed (3 states)
- ❑ Additional promising strategies may include retailer licensing, marketing restrictions, taxation
- ❑ CDC will soon track ENDS legislation on http://www.cdc.gov/tobacco/state_system/

States and Communities

Rationale for prohibiting ENDS use in all places where smoking is not allowed

- ❑ Compare to clean air, not cigarette smoke**
- ❑ There are no manufacturing standards**
- ❑ Potential to expose youth, pregnant women, and non-smokers to aerosolized nicotine and other toxins**
- ❑ No evidence public use is necessary for smokers to “switch” – could enable dual use**

Smokeless Tobacco

Smokeless Tobacco

□ Types of smokeless tobacco:

- Chewing tobacco (loose leaf, plug, or twist and may come in flavors)
- Snuff (moist, dry, or in packets [U.S. **snus**])
- **Dissolvables** (lozenges, sticks, strips, orbs)



Snus

- ❑ A type of moist snuff
- ❑ Packaged in ready-to-use pouches that resemble small tea bags
- ❑ Pouch is placed between cheek or teeth and gums, does not require spitting
- ❑ Market share data unavailable





Dissolvables



Form	Description	Market Share (in 2011)
Lozenges	Resemble pellets or tablets	Data unavailable
Orbs	Resemble small mints	Data unavailable
Sticks	Toothpick-like appearance	Data unavailable
Strips	Thin sheets like breath or medication strips	Data unavailable

Health Effects (Smokeless)

- ❑ **Nicotine addiction**
- ❑ **Cancer of the mouth, esophagus and pancreas**
- ❑ **Leukoplakia, gum disease**
- ❑ **Increased risk for preterm birth and stillbirth when used during pregnancy (Swedish snus)**
- ❑ **Nicotine poisoning in children**
- ❑ **May increase the risk of death from heart disease and stroke**

U.S. Department of Health and Human Services. The Health Consequences of Smoking: 50 Years of Progress. A Report of the Surgeon General. Atlanta, Georgia. . U.S. Department of Health and Human Services , Centers for Disease Control and Prevention. Office on Smoking and Health 2014.

Piano MR, Benowitz NL, FitzGerald GA, et al. Impact of smokeless tobacco products on cardiovascular disease: Implications for Policy, Prevention, and Treatment. A policy statement from the American Heart Association. Circulation 2010;122:1520-44.

US Snus

Table 3
Mean values of total moisture, total nicotine, and pH and unprotonated nicotine using either 10 mL or 20 mL of water for each domestic oral tobacco product type.

Tobacco type	Number of brands	Total moisture (%) Mean	Total nicotine (mg/g, wet) Mean	pH		Unprotonated nicotine (mg/g, wet)	
				Mean		Mean	
				10 mL	20 mL	10 mL	20 mL
Dry snuff	5	6.52	17.6	5.86	5.99	0.13	0.18
Loose leaf	3	21.9	6.29	5.74	5.82	0.04	0.04
Twist	3	15.0	30.6	5.34	5.39	0.10	0.11
Plug	4	18.3	8.68	5.48	5.55	0.03	0.03
Dry snuff (pouch)	4	6.18	11.7	6.94	6.98	1.08	1.14
Snus	3	25.9	10.1	7.64	7.64	2.97	3.01

Lawler, Stanfill, Zhang, Ashley, Watson. Chemical characterization of domestic oral products: Total nicotine, pH, unprotonated nicotine, and tobacco-specific N-nitrosamines. Food and Chemical Toxicity 2013 57:380-6.

US Snus

Table 5

Levels of five tobacco-specific N-nitrosamines found in 29 brands representative of seven types of oral tobacco marketed in the United States.

Tobacco product type	Brand	NAB ^a (ng/g, wet)		NAT (ng/g, wet)		NNK (ng/g, wet)		NNN (ng/g, wet)		NNAL (ng/g, wet)		Total TSNA (ng/g, wet)
		Mean ^b	(SD) ^c	Mean	(SD)	Mean	(SD)	Mean	(SD)	Mean	(SD)	Sum
Plug	Days o Work	30	(10)	762	(79)	340	(28)	2920	(900)	41	(1.1)	4090
	Conwood Sun Cured	69	(10)	1520	(260)	844	(226)	3130	(260)	11	(11)	5580
	Levi Garrett	199	(29)	1330	(100)	941	(78)	5140	(90)	140	(49)	7750
	Taylor's Pride Plug Chew	183	(6.1)	1400	(100)	803	(83)	4640	(350)	188	(44)	7210
Loose Leaf	Beech-Nut Chew	23	(2.3)	563	(28)	300	(32)	1640	(60)	21	(0.9)	2550
	Taylor's Pride Chew	76	(17)	796	(72)	306	(22)	2830	(240)	90	(80)	4100
	Red Man Chew	16	(2.5)	351	(27)	238	(23)	942	(22)	20 ^d	(23)	1550
Snus	Camel Snus Frost	28	(1.3)	265	(37)	146	(13)	425	(53)	20	(3.0)	884
	Camel Snus Spice	28	(8.5)	259	(35)	84	(22)	369	(59)	21	(12)	761
	Camel Snus Original	26	(10)	251	(32)	140	(58)	389	(111)	20	(14)	826
Dissolvable	Stonewall Wintergreen	10	(0.2)	218	(9.3)	49	(5.4)	94	(5.8)	n.d.	(-)	271
	Stonewall Java	11	(1.3)	251	(8.0)	63	(3.5)	103	(17)	n.d.	(-)	428
	Stonewall Natural	11	(1.5)	247	(4.0)	73	(6.4)	117	(8.5)	n.d.	(-)	448
	Ariva Java	7.0	(1.4)	178	(11)	54	(5.2)	74	(6.8)	n.d.	(-)	313
	Ariva Wintergreen	8.0	(0.8)	176	(3.8)	52	(1.4)	77	(14)	n.d.	(-)	313
	Camel Orbs Mellow	15	(0.4)	176	(15)	147	(7.1)	189	(3.7)	5.6	(1.4)	533
	Camel Orbs Fresh	17	(0.4)	194	(26)	202	(4.4)	193	(8.7)	5.8	(1.8)	612

Lawler, Stanfill, Zhang, Ashley, Watson. Chemical characterization of domestic oral products: Total nicotine, pH, unprotonated nicotine, and tobacco-specific N-nitrosamines. Food and Chemical Toxicity 2013 57:380-6.

US Snus

- ❑ **Camel and Marlboro Snus are top-selling brands**
- ❑ **2006-2010, 147 samples**
- ❑ **Compared with 2006**
 - Pouch size increased in both brands
 - Camel snus pouches were higher in total, unprotonated nicotine and NNN /NNK by 1.9, 2.4, 3.3- fold respectively.
 - Marlboro snus pouches were higher in total, unprotonated nicotine by 2.1, 1.9, fold, respectively but 1.5-fold lower in NNN /NNK.

- Stepanov I, Jensen J, Biener L, Bliss RL, Hecht SS, Hatsukami DK. Increased pouch sizes and resulting changes in the amounts of nicotine and tobacco-specific N-nitrosamines in single pouches of Camel Snus and Marlboro Snus. *Nicotine Tob Res.* 2012 Oct;14(10):1241-5.

US Snus

- ❑ **2011, 216 samples gathered from 6 US regions, compared with samples collected in 2010**
 - TSNA levels increased in Marlboro and Camel snus, and in some Camel dissolvables
 - Unprotonated nicotine levels did not change compared with 2010, but varied by region, as much as 3.2-fold

Stepanov I, Biener L, Yershova K, Nyman AL, Bliss R, Parascandola M, Hatsukami DK. Monitoring tobacco-specific N-nitrosamines and nicotine in novel smokeless tobacco products: findings from round II of the new product watch. *Nicotine Tob Res.* 2014 Aug;16(8):1070-8.

US Snus

TobaccoToday

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[It's Official: Big Pharma is Lobbying Against Electronic Cigarettes- Dr. Michael Siegel →](#)

Swedish Match submits 100,000+ page Modified Risk Tobacco Product (MRTP) application to FDA to truthfully market General Snus to smokers as less hazardous alternative to cigarettes

June 14th, 2014 | [Current Issues, Regulations: FDA etc.](#), [Snus, Snuff & Alternative Products in US Markets](#), [tobacco](#), [Tobacco Harm Reduction](#) | [ECigInsider](#)

RICHMOND, Va. — Copyright 2014 The Associated Press- Smokeless tobacco maker Swedish Match is asking the Food and Drug Administration to certify its General-branded pouches of tobacco as less harmful than cigarettes.

The company with its North American headquarters in Richmond, Virginia, is filing an application with the FDA to approve the snus (pronounced "snoose") products as "modified risk."

<http://www.tobaccotoday.info/2014/06/14/swedish-match-submits-100000-page-modified-risk-tobacco-product-mrtp-application-to-fda-to-truthfully-market-general-snus-to-smokers-as-less-hazardous-alternative-to-cigarettes/>

Dissolvables

WINSTON-SALEM JOURNAL
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R.J. Reynolds scales back marketing of dissolvable tobacco products

Story Comments Image (1) Print Font Size: - +

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Posted: Wednesday, July 31, 2013 11:05 am | Updated: 11:56 am, Fri Aug 2, 2013.
Richard Craver/Winston-Salem Journal



Courtesy of R.J. Reynolds

R.J. Reynolds Tobacco Co. has struggled to the extent that it is limiting future marketing of the products: a pellet (Camel Orbs), a twisted stick the size of a toothpick (Camel Sticks) and a film strip for the tongue (Camel Strips).

After spending more than 4 1/2 years in five test markets, including Charlotte, R.J. Reynolds Tobacco Co. has struggled to gain consumer traction for its trio of dissolvable tobacco products.

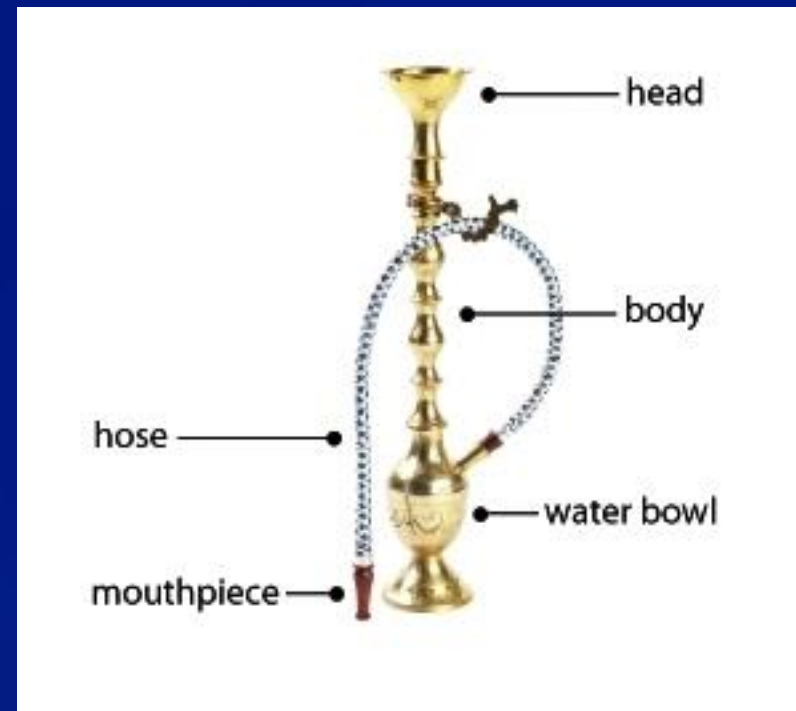
It has struggled to the extent that it is limiting future marketing of the products: a pellet (Camel Orbs), a twisted stick the size of a toothpick (Camel Sticks) and a film strip for the tongue (Camel Strips).

The goal has been making its tobacco products more accessible within a society that's clamping down on smoking. Reynolds

http://www.journalnow.com/business/business_news/local/article_9d001b58-f9f2-11e2-8fad-0019bb30f31a.html

Hookah

- ❑ Water pipes that are used to smoke specially made tobacco that comes in different flavors, such as apple, mint, cherry, chocolate, coconut, licorice, cappuccino
- ❑ Also called *narghile*, *argileh*, *shisha*, *hubble-bubble*, and *goza*
- ❑ Often smoked in groups, mouth piece shared.



Hookah

- ❑ Many users think it is less harmful, hookah smoking has many of the same health risks as cigarette smoking (cancer, cardiovascular disease)
- ❑ Hookahs produce high levels of carcinogens and carbon monoxide
- ❑ An hour-long hookah session can involve 200 puffs, and 90,000 ml of smoke inhaled, compared with 20 puffs from smoking a single cigarette, or 500 ml smoke



Hookah

- ❑ **High school seniors**
 - 1 of 5 boys, 1 of 6 girls used hookah in the last year
- ❑ **College students**
 - 22-40% used in last year
- ❑ **Adults**
 - 18.2% of 18-24 year olds use everyday, some days, or rarely



College Students

- ❑ **Study of 2 universities in the Southeast, 2000 students**
- ❑ **Marijuana (19.2%) and hookah (16.4%) were the most commonly used products in the last month**
- ❑ **E-cigarettes were lower (4.5%)**
- ❑ **There were high rates of concurrent use, esp. in e-cigarette users**
- ❑ **Marijuana was the most positively perceived product followed by hookah and e-cigarettes**

Hookah

PERCEPTIONS OF TOBACCO PRODUCTS AND MARIJUANA

5

TABLE 2. Concurrent use of tobacco products and marijuana

Product	Cigarettes <i>n</i> = 315 16.0%	Cigar products <i>n</i> = 293 14.9%	Smokeless tobacco <i>n</i> = 51 2.6%	Hookah <i>n</i> = 322 16.4%	Electronic cigarettes <i>n</i> = 88 4.5%	Marijuana <i>n</i> = 377 19.2%
Cigarettes	–	43.3%	56.9%	41.0%	71.6%	38.7%
Cigar products	40.3%	–	54.9%	39.8%	46.6%	47.5%
Smokeless tobacco	9.2%	9.6%	–	7.1%	17.0%	5.0%
Hookah	41.9%	43.7%	45.1%	–	54.5%	41.1%
Electronic cigarettes	20.0%	14.0%	29.4%	14.9%	–	12.5%
Marijuana	46.3%	61.1%	37.3%	48.1%	53.4%	–

Note: All chi-squared *p*-values < 0.001. To interpret, among users of column heading, % also using row heading in the past 30 days. Example: Of the 315 cigarette smokers, 40.3% also smoked cigar products in the past 30 days.

FDA Center for Tobacco Products

Proposed newly “deemed” products would include electronic cigarettes, cigars, pipe tobacco, **certain dissolvables** that are not “smokeless tobacco,” gels, and **waterpipe tobacco**. Once the proposed rule becomes final, FDA can use regulatory tools, such as age restrictions and requiring scientific review of new tobacco products and claims to reduce tobacco-related disease and death

FDA Regulation of e-Cigarettes

Only e-cigarettes that are marketed for therapeutic purposes are currently regulated by the FDA Center for Drug Evaluation and Research (CDER). Currently, the FDA Center for Tobacco Products (CTP) regulates

- cigarettes,
- cigarette tobacco,
- roll-your-own tobacco, and
- smokeless tobacco.

FDA has issued a proposed rule that would extend the agency’s tobacco authority to cover additional products that meet the legal definition of a tobacco product, such as e-cigarettes. FDA’s [Extending Authorities to Additional Tobacco Products webpage](#) offers more information on the proposed rule.

For more information on current regulation:

- [Tobacco Product Regulation](#)
- [Nicotine-Containing Products](#)

Key Take Away Points



Summary

- ✓ **ENDS are not “safe”**
- ✓ **Unregulated sale and distribution driving demand**
- ✓ **Cessation claims are unproven**
- ✓ **Potential for harm and benefit depends on the context of combusted tobacco products**
- ✓ **Dual use/delayed quitting is a major concern**

Key Take Away Points



- ✓ **Emerging smokeless products are not without risk and their use can result in exposure to high levels of nicotine and carcinogens**
- ✓ **Hookah is used less frequently than cigarettes, but a single hookah session can result in high levels of exposure to carcinogens and carbon monoxide**
- ✓ **Many young adults who use hookah use other tobacco products concurrently**

Contact

Lucinda England, MD, MSPH

LBE9@cdc.gov

CDC Office on Smoking and Health



www.cdc.gov/tobacco



Resources

USPHSTF

- <http://www.uspreventiveservicestaskforce.org/>
- <http://www.fda.gov/TobaccoProducts/default.htm>
- http://www.tobaccofreekids.org/tobacco_unfiltered/tag/e-cigarettes



CDC

- <http://www.cdc.gov/tobacco/campaign/tips/>
- <http://www.cdc.gov/reproductivehealth/TobaccoUsePregnancy/Providers.html>



Online training

- <http://iml.dartmouth.edu/education/dsr/>
- <https://www.smokingcessationandpregnancy.org/>



Resources

Electronic cigarettes

- <http://www.fda.gov/TobaccoProducts/default.htm>
- http://www.tobaccofreekids.org/tobacco_unfiltered/tag/e-cigarettes
- <http://www.cdc.gov/reproductivehealth/TobaccoUsePregnancy/Providers.html>
- <http://publichealthlawcenter.org/programs/tobacco-control-legal-consortium>

