Children's Safety Network
National Injury and Violence Prevention Resource Center

Preventing E-Cigarette Poisoning among Children and Youth

December 11, 2014

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Meeting Orientation Slide

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Presenters

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American Association of Poison Control Centers

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Poll

E-cigarettes & Poison Centers

The public health significance of growing e-cigarette prevalence from the perspective of the nation's poison centers.

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Overview

- About AAPCC, poison centers, and NPDS
- What are e-cigarettes?
  - Key terms
  - FAQs
  - E-cigarettes and youth
- E-cigarettes and poison centers
  - Exposure data
  - Difficulties of managing exposure cases
- E-cigarettes and the AAPCC
  - Two press releases

About AAPCC

- The American Association of Poison Control Centers (AAPCC) is dedicated to actively advancing the health care role and public health mission of our members through information, advocacy, education and research.
- Support 55 member poison centers through:
  - Advocacy
  - Accreditation (centers)
  - Certification (experts)
  - Communication
  - Promotion of local services
  - Public education
- Collate and disseminate national data (NPDS).
- Located in Alexandria, VA

www.aapcc.org

Aapcc.org, e-cigarettes alerts page

http://www.aapcc.org/alerts/e-cigarettes/

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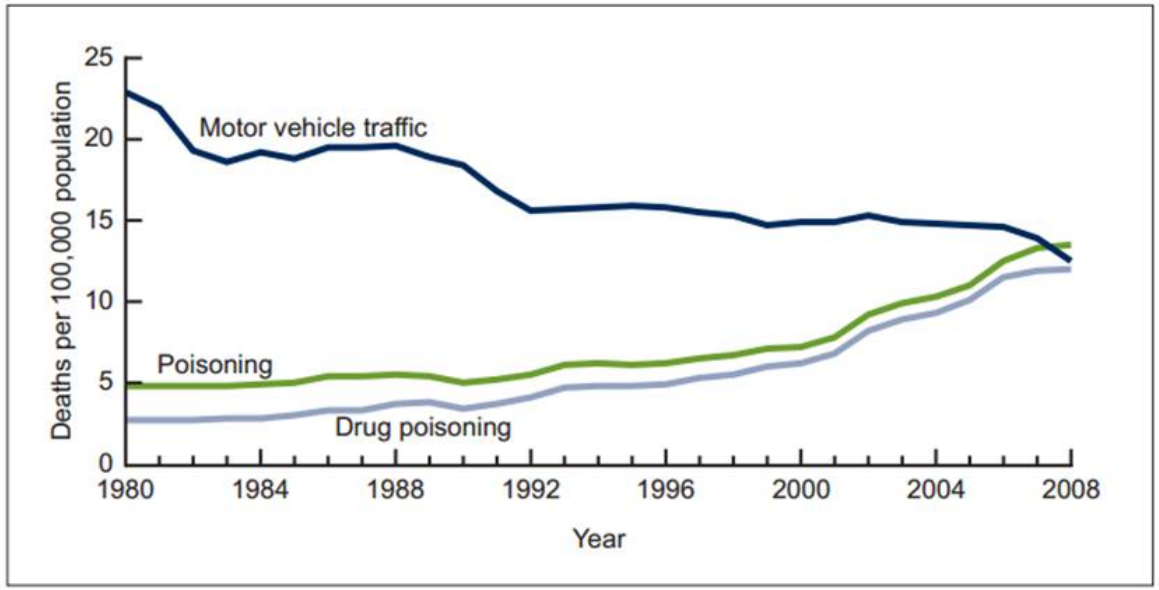
Why do we need poison centers?

Poisoning is now the leading cause of death from injuries in the United States and nearly 9 out of 10 poisoning deaths are caused by drugs.

Figure 1. Motor vehicle traffic, poisoning, and drug poisoning death rates: United States, 1980–2008



NOTE: In 1999, the *International Classification of Diseases, Tenth Revision (ICD–10)* replaced the previous revision of the ICD (ICD–9). This resulted in approximately 5% fewer deaths being classified as motor-vehicle traffic–related deaths and 2% more deaths being classified as poisoning-related deaths. Therefore, death rates for 1998 and earlier are not directly comparable with those computed after 1998. Access data table for Figure 1 at http://www.cdc.gov/nchs/data/databriefs/db81_tables.pdf#1.
SOURCE: CDC/NCHS, National Vital Statistics System.

Warner M, Chen LH, Makuc DM, Anderson RN, Miniño AM. Drug poisoning deaths in the United States, 1980-2008. NCHS Data Brief. 2011 Dec;(81):1-8. http://www.cdc.gov/nchs/data/databriefs/db81.pdf

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Why do we need poison centers?

National Estimates of the 10 Leading Causes of Nonfatal Injuries Treated in Hospital Emergency Departments, United States – 2013

	Age Groups										
Rank	<1	1-4	5-9	10-14	15-24	25-34	35-44	45-54	55-64	65+	Total
1	Unintentional Fall 134,229	Unintentional Fall 852,884	Unintentional Fall 624,890	Unintentional Struck By/Against 561,690	Unintentional Struck By/Against 905,659	Unintentional Fall 742,177	Unintentional Fall 704,264	Unintentional Fall 913,871	Unintentional Fall 930,521	Unintentional Fall 2,495,397	Unintentional Fall 8,771,656
2	Unintentional Struck By/Against 28,786	Unintentional Struck By/Against 336,917	Unintentional Struck By/Against 403,522	Unintentional Fall 558,177	Unintentional Fall 814,829	Unintentional Overexertion 638,745	Unintentional Overexertion 530,422	Unintentional Overexertion 461,114	Unintentional Overexertion 286,126	Unintentional Struck By/Against 261,279	Unintentional Struck By/Against 4,214,125
3	Unintentional Other Bite/Sting 12,186	Unintentional Other Bite/Sting 158,587	Unintentional Cut/Pierce 112,633	Unintentional Overexertion 294,869	Unintentional Overexertion 672,946	Unintentional Struck By/Against 599,340	Unintentional Struck By/Against 444,089	Unintentional Struck By/Against 390,931	Unintentional Struck By/Against 261,840	Unintentional Overexertion 212,293	Unintentional Overexertion 3,256,567
4	Unintentional Foreign Body 10,650	Unintentional Foreign Body 139,597	Unintentional Other Bite/Sting 107,975	Unintentional Cut/Pierce 114,285	Unintentional MV-Occupant 627,565	Unintentional MV-Occupant 528,303	Unintentional MV-Occupant 374,231	Unintentional Other Specified 385,221	Unintentional MV-Occupant 227,620	Unintentional MV-Occupant 197,646	Unintentional MV-Occupant 2,462,684
5	Unintentional Other Specified 10,511	Unintentional Cut/Pierce 83,575	Unintentional Overexertion 93,612	Unintentional Pedal Cyclist 84,732	Unintentional Cut/Pierce 431,691	Unintentional Cut/Pierce 402,197	Unintentional Other Specified 300,154	Unintentional MV-Occupant 343,470	Unintentional Other Specified 212,168	Unintentional Cut/Pierce 156,693	Unintentional Cut/Pierce 2,077,775
6	Unintentional Fire/Burn 9,816	Unintentional Overexertion 81,588	Unintentional Pedal Cyclist 74,831	Unintentional Unknown/ Unspecified 84,668	Other Assault* Struck By/Against 381,522	Other Assault* Struck By/Against 342,514	Unintentional Cut/Pierce 297,769	Unintentional Cut/Pierce 282,353	Unintentional Cut/Pierce 189,440	Unintentional Poisoning 100,988	Unintentional Other Specified 1,767,630
7	Unintentional** Inhalation/ Suffocation 8,294	Unintentional Other Specified 65,120	Unintentional Foreign Body 63,450	Unintentional MV-Occupant 73,692	Unintentional Other Specified 321,914	Unintentional Other Specified 335,990	Other Assault* Struck By/Against 207,287	Unintentional Poisoning 237,328	Unintentional Poisoning 153,767	Unintentional Other Bite/Sting 90,850	Other Assault* Struck By/Against 1,291,100
8	Unintentional Cut/Pierce 7,139	Unintentional Fire/Burn 52,884	Unintentional MV-Occupant 58,114	Unintentional Other Bite/Sting 64,848	Unintentional Other Bite/Sting 177,665	Unintentional Other Bite/Sting 180,922	Unintentional Poisoning 175,870	Other Assault* Struck By/Against 169,668	Unintentional Other Bite/Sting 97,474	Unintentional Other Specified 86,729	Unintentional Other Bite/Sting 1,174,267
9	Unintentional Unknown/ Unspecified 5,735	Unintentional Unknown/ Unspecified 41,297	Unintentional Dog Bite 43,499	Other Assault* Struck By/Against 62,829	Unintentional Unknown/ Unspecified 163,923	Unintentional Poisoning 180,448	Unintentional Other Bite/Sting 138,410	Unintentional Other Bite/Sting 145,349	Other Assault* Struck By/Against 73,674	Unintentional Unknown/ Unspecified 74,864	Unintentional Poisoning 1,055,960
10	Unintentional Overexertion 4,985	Unintentional Poisoning 32,443	Unintentional Unknown/ Unspecified 35,303	Unintentional Other Transport 35,609	Unintentional Poisoning 152,962	Unintentional Unknown/ Unspecified 129,308	Unintentional Unknown/ Unspecified 106,496	Unintentional Unknown/ Unspecified 110,102	Unintentional Unknown/ Unspecified 67,974	Unintentional Other Transport 68,022	Unintentional Unknown/ Unspecified 819,878

*The "Other Assault" category includes all assaults that are **not** classified as sexual assault. It represents the majority of assaults.
**Injury estimate is unstable because of small sample size.
Data Source: NEISS All Injury Program operated by the Consumer Product Safety Commission (CPSC).
Produced by: National Center for Injury Prevention and Control, CDC using WISQARS™.

Centers for Disease Control and Prevention National Center for Injury Prevention and Control

http://www.cdc.gov/injury/wisqars/pdf/leading_cause_of_nonfatal_injury_2013-a.pdf

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About Poison Centers- Video

VIDEO

http://poisonhelp.hrsa.gov/resources/videos/making-connections/index.html

About Poison Centers

- 55 PCs in the U.S.; provide free, expert information and treatment advice, 24/7/365, through the national Poison Help line: **1-800-222-1222**
- Cover of 100% of U.S. population; 150 languages.
- $1 spent on PCs saves $13.39 in HC costs and lost productivity.[1]
- Provide extensive educational and preventive outreach through educators.
- Feed data into the National Poison Data System (NPDS)- the only near real-time comprehensive poisoning surveillance database in the US.[2]

1. http://www.aapcc.org/about/lewin-group-report/
2. http://www.aapcc.org/data-system/

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About Poison Centers

For more information about poison centers, visit www.aapcc.org.

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About NPDS Data

- **National Poison Data System** (NPDS) is the only comprehensive poisoning exposure surveillance database in the US.
- Contains information from the human poison exposure cases from all 55 poison centers across the country.
- Contains more than 50 million poison exposure case records, with more than two million new records added each year; starting year is 1985.
- Information and human exposure case data are continually uploaded to NPDS from all the poison centers about every 13 minutes, providing a near real-time snapshot of poisoning conditions nationwide.
- Previous year's data set closes every October; annual report usually available before the following January.
- Interested in learning more about NPDS or submitting a data request? Visit http://www.aapcc.org/data-system/.

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Key Terms

E-cigarette, a.k.a. “electronic cigarette,” “e-cig,” “personal vaporizer (PV),” or “electronic nicotine delivery system (ENDS)”:

- Battery-powered vaporizer which simulates tobacco smoking.[1]
- Often resemble cigarettes, cigars or pipes.
- Deliver a vaporized propylene glycol /nicotine mixture into user’s respiratory system as a vapor (instead of smoke).
- The vapor comes from heating the mixture. When heated, the cartridge that contains the liquid nicotine converts the contents into a vapor that the user inhales.

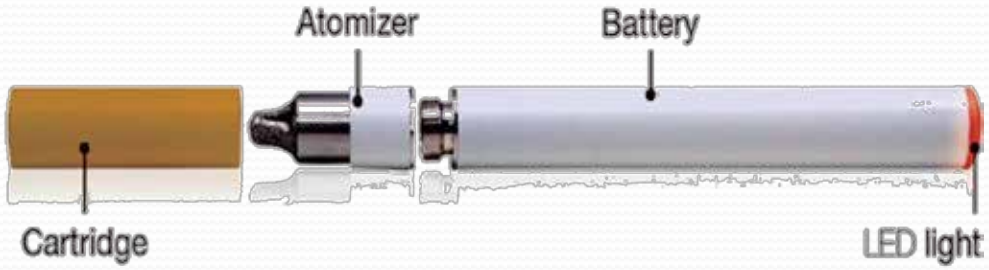
1. Caponnetto, Pasquale; Campagna, Davide; Papale, Gabriella; Russo, Cristina; Polosa, Riccardo (2012). "The emerging phenomenon of electronic cigarettes". *Expert Review of Respiratory Medicine* **6** (1): 63–74. doi:10.1586/ers.11.92. ISSN 1747-6348.PMID 22283580.

About E-Cigarettes

3 Main Components: A lithium battery that is rechargeable, a vaporizing chamber, and a cartridge.

1. **The lithium battery** - Found in the device is responsible for powering the e-cigarette. Users can charge the battery using a charger that is similar to those used for mobile phone batteries. The battery is connected to…
2. **The vaporization chamber** – This is a hollow tube that holds the electronic controls and atomizer. The atomizer is what creates the vapor. Before activating the device, the user attaches…
3. **The Cartridge** – containing the nicotine liquid with the vaporization chamber. The tip of the cartridge is what acts as the mouthpiece of the e-cigarette.

Users of e-cigarettes inhale the vapor in the same way they would with a conventional tobacco cigarette. Inhalation is what activates the atomizer to heat the liquid that is present in the cartridge.



http://1stgenerationff.com/

This heating process converts the liquid into vapor. When users inhale the vapor through the mouthpiece, nicotine is delivered to their lungs. The exhaled vapor looks much like a regular cloud of cigarette smoke.

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Key Terms

- **Vaping**: inhaling and exhaling the "vapor" produced by an electronic cigarette or similar device.
- **E-liquid**, a.k.a. "e-juice": Usually a mixture of propylene glycol, glycerin, nicotine, and flavorings.[1] E-liquids as currently sold are a threat to small children because they are not required to be childproof, and they come in candy and fruit flavors that are appealing to children.
- **Nicotine vs. tobacco:** E-cigs do not contain tobacco, although they do use nicotine from tobacco plants.[2]
- **Exposure**: Term used to distinguish between PC calls where someone is asking for information vs. someone has ingested, inhaled, or absorbed a product through the skin or eyes.

1. Benowitz, N; Glantz, SA (13 May 2014). "E-cigarettes: a scientific review.". *Circulation* **129** (19): 1972–86.doi:10.1161/circulationaha.114.007667. PMC 4018182.PMID 24821826.
2. O'Connor, RJ (March 2012). "Non-cigarette tobacco products: what have we learnt and where are we headed?". *Tobacco control* **21** (2): 181–90. doi:10.1136/tobaccocontrol-2011-050281.PMC 3716250. PMID 22345243.

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time.com/3590093/oxfords-2014-word-of-the-year-is-vape/

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Oxford's 2014 Word of the Year Is Vape

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NEWSFEED SOCIETY

Oxford's 2014 Word of the Year Is *Vape*

Katy Steinmetz @katysteinmetz | Nov. 17, 2014

Oxford's editorial staff says the word is tied to this year's big debates about health and society

Getty Images

Oxford's lexicographers keep watch over billions of words every month—from literary novels to academic journals to blogs—and at the end of the year they put their brainy heads together to select a single word that best embodies the zeitgeist. Out of this year's haze of nominees and debate emerged four little letters.

Oxford's word of the year for 2014 is ***vape***.

Vape, a verb meaning to inhale and exhale the vapor produced by an electronic cigarette or similar device, beat out everything from *bae* to *normcore*. It was coined in the late 1980s when companies like RJR

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http://time.com/3590093/oxfords-2014-word-of-the-year-is-vape/

About E-Cigarettes

- First invented in the 1960's, but first entered the marketplace in 2003 in China[1]
- Patented internationally in 2007[2]
- Widespread marketing of e-cigs and the entry of the three big U.S. tobacco companies into the e-cig market have contributed to increased attention to these products.
- Sales of e-cigarettes approached $2 billion in 2013, and are estimated to surpass $10 billion by 2017[3]
- As of early 2014, there were 466 brands and 7764 unique flavors of e-cigarette products[4]

1. Foulds J, Veldheer S, Berg A. Electronic cigarettes (e-cigs): views of aficionados and clinical/public health perspectives. Int J Clin Pract. 2011;65:1037–1042 AHA5
2. Bell K, Keane H. Nicotine control: e-cigarettes, smoking and addiction. Int J Drug Policy. 2012;23:242–247.
3. Herzog B, Gerberi J. Equity Research: E-Cigs Revolutionizing the Tobacco Industry. Wells Fargo Securities, LLC Equity Research Department;2013.
4. Zhu SH, Sun JY, Bonnevie E, Cummins SE, Gamst A, Yin L, Lee M. Four hundred and sixty brands of e-cigarettes and counting: implications for product regulation. Tob Control. 2014;23(suppl 3):iii3–iii9.

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FAQs

- **How does vaping differ from traditional smoking?**
  - E-cigs thought to not expose the user to carcinogens in conventional cigarettes. Exhaled vapor, but no secondhand *smoke* (product of combustion). Has been shown that e-cigs are a source of secondhand exposure to nicotine.[1]

1. Czogala J, Goniewicz ML, Fidelus B, Zielinska-Danch W, Travers MJ, Sobczak A. Secondhand exposure to vapors from electronic cigarettes. Nicotine Tob Res. 2014 Jun;16(6):655-62. doi: 10.1093/ntr/ntt203. Epub 2013 Dec 11. PubMed PMID: 24336346.

FAQs

- **Is vaping safer than smoking?**
  - E-cigarettes perceived to be less harmful than regular cigarettes by e-cigarette users.[1]
  - **Nicotine addiction**: perhaps safer. Nicotine's level of addictiveness can vary depending on its mode of delivery. In cigarettes, nicotine is highly addictive. FDA-approved NRTs are minimally addictive and can be used long term. Studies suggest current generation of e-cigs on the market less addictive than combustible cigarettes and closer in profile to NRTs.[2,3] Range varies, but less nicotine exposure from the use of e-cigs than the use of regular cigarettes.[2]
  - **Cancer risk**: not sure. No tar and fewer carcinogens in e-juice and the vapor, as opposed to the approx. 60 carcinogens in traditional cigarettes. However, new studies are finding that e-cigs do expose users to some carcinogens, such as formaldehyde.[4]
  - E-cig vapors do contain some **toxic substances**, but in one study the levels of the toxicants were 9-450 times lower than in cigarette smoke.[3]
  - American Heart Association considers e-cigs to be safer than regular cigarettes[5]; many researchers agree that e-cigarettes will turn out to be much safer than conventional cigarettes.
  - Long-term studies are needed to truly asses whether vaping is safer than smoking.

1. Etter JF. Electronic cigarettes: a survey of users. BMC public health. 2010;10:231.
2. Goniewicz ML, Kuma T, Gawron M, Knysak J, Kosmider L. Nicotine levels in electronic cigarettes. Nicotine & tobacco research :official journal of the Society for Research on Nicotine and Tobacco. Jan 2013;15(1):158-166.
3. Goniewicz ML, Knysak J, Gawron M, et al. Levels of selected carcinogens and toxicants in vapour from electronic cigarettes. Tobacco control. Mar 6 2013.
4. Kosmider L, Sobczak A, Fik M, Knysak J, Zaciera M, Kurek J, Goniewicz ML. Carbonyl compounds in electronic cigarette vapors: effects of nicotine solvent and battery output voltage. Nicotine Tob Res. 2014 Oct;16(10):1319-26. doi: 10.1093/ntr/ntu078. Epub 2014 May 15. PubMed PMID: 24832759.
5 Electronic Cigarettes - A Policy Statement From the American Heart Association (2014)

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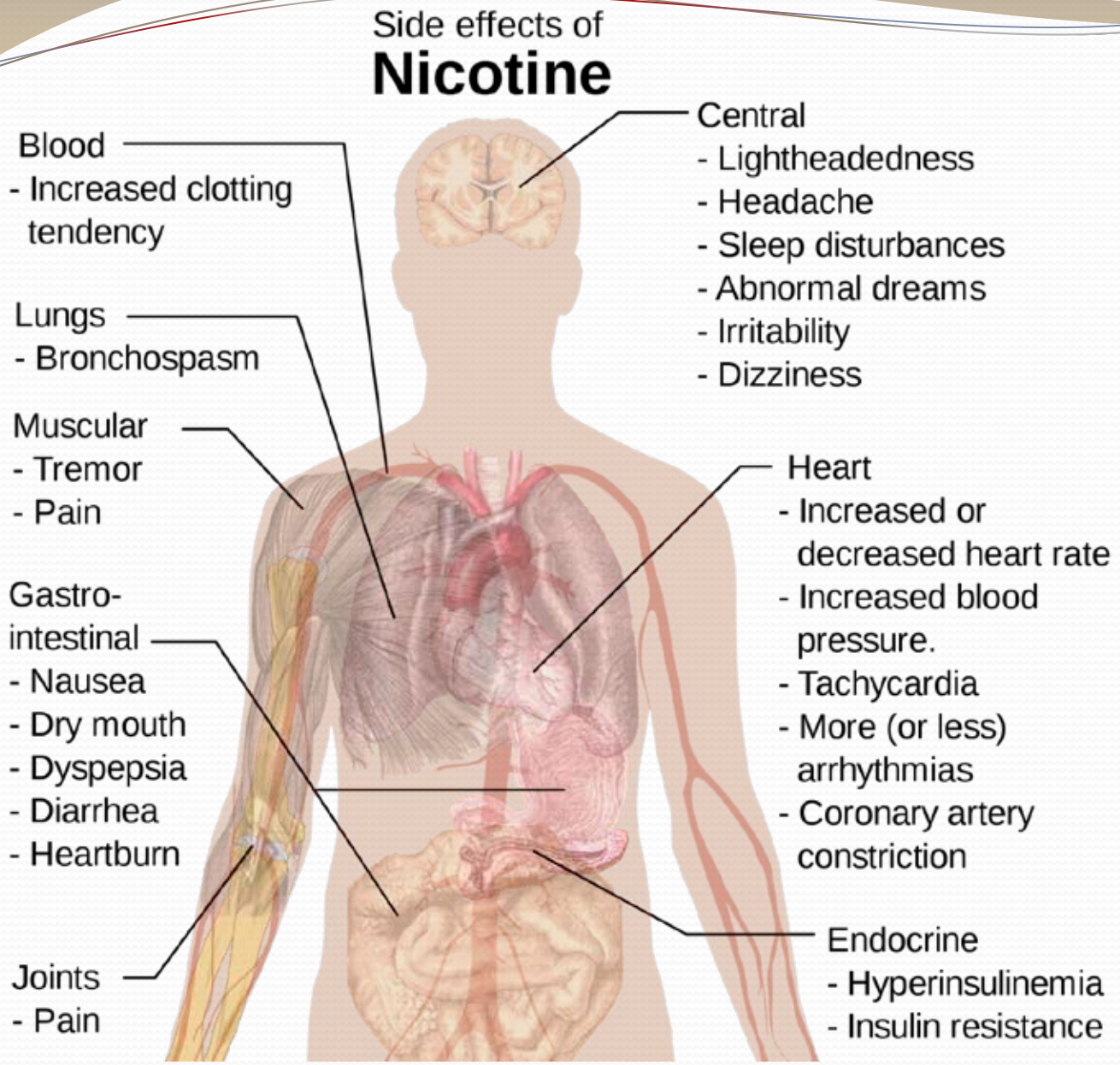

"Nicotine is also a psychoactive and addictive substance that directly acts on brain areas involved in emotional and cognitive processing. Early exposure to nicotine during the transition from child to adult may be harmful, since it may derange the normal course of brain maturation and have lasting consequences for cognitive ability, mental health, and even personality."

Diagram from Wikimedia.org; quote from Goriounova NA, Mansvelder HD, study can be found here: http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3543069/

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E-cigarettes & Youth

- Teens may be more susceptible to nicotine addiction[1], mounting evidence that nicotine's adverse effects on adolescent brain development could result in lasting deficits in cognitive function[2,3]
- Some evidence suggests vaping leads to smoking in young adults[3,4]
- Ever use of e-cigs more than doubled from 3.3% in 2011 to 6.8% in 2012 among U.S. middle and high school students.[5]
- The majority of youth e-cig users are current smokers; 2012 data showed that 80.5% of high school students who were past 30-day e-cigarette users were also past 30-day regular cigarette smokers.[5]
- Dual use of e-cigs and regular cigarettes increased from 0.8% to 1.6% among middle school students from 2011-2012 and from 0.8% to 1.9% among high school students from 2010-2011.[5,6]
- Current data insufficient to determine whether e-cigs are a gateway to cigarette use, a gateway *out* of cigarette use or have no influence on cigarette use. More data is needed in this area.
- Youth who have tried e-cigarettes also indicate greater motivation to quit smoking, suggesting they may want to stop using combustible cigarettes.[7]

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E-cigarettes & Youth (sources)

1. Rubinstein, M. L., Shiffman, S., Moscicki, A.-B., Rait, M. A., Sen, S. and Benowitz, N. L. (2013), Nicotine metabolism and addiction among adolescent smokers. Addiction, 108: 406–412. doi: 10.1111/j.1360-0443.2012.04026.x
2. Goriounova NA, Mansvelder HD. Short- and Long-Term Consequences of Nicotine Exposure during Adolescence for Prefrontal Cortex Neuronal Network Function. *Cold Spring Harbor perspectives in medicine*2012;2(12):10.1101/cshperspect.a012120 a012120. doi:10.1101/cshperspect.a012120.
3. Bunnell RE, Agaku IT, Arrazola RA, Apelberg BJ, Caraballo RS, Corey CG, Coleman BN, Dube SR, King BA. Intentions to Smoke Cigarettes Among Never-Smoking U.S. Middle and High School Electronic Cigarette Users, National Youth Tobacco Survey, 2011-2013. Nicotine Tob Res. 2014 Aug 20. pii: ntu166. [Epub ahead of print] PubMed PMID: 25143298
4. Coleman BN, Apelberg BJ, Ambrose BK, Green KM, Choiniere CJ, Bunnell R, King BA. Association Between Electronic Cigarette Use and Openness to Cigarette Smoking Among U.S. Young Adults. Nicotine Tob Res. 2014 Nov 4. pii: ntu211. [Epub ahead of print] PubMed PMID: 25378683.
5. Centers for Disease Control and Prevention. Notes from the field: electronic cigarette use among middle and high school students - United States, 2011-2012. MMWR. Morbidity and mortality weekly report. Sep 6 2013;62(35):729-730.
6. Camenga DR, Delmerico J, Kong G, et al. Trends in use of electronic nicotine delivery systems by adolescents. Addictive behaviors. Sep 17 2013.
7. Dutra LM, Glantz SA. Electronic Cigarettes and Conventional Cigarette Use Among US Adolescents: A Cross-sectional Study. JAMA pediatrics. Mar 6 2014.

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FAQs

- **Are e-cigarettes currently regulated by the Food and Drug Administration?**
  - No. An April 2014 proposal from the Food and Drug Administration would require most e-cigs to undergo an agency review.
  - States and localities have pursued their own legislation in the absence of federal regulation.

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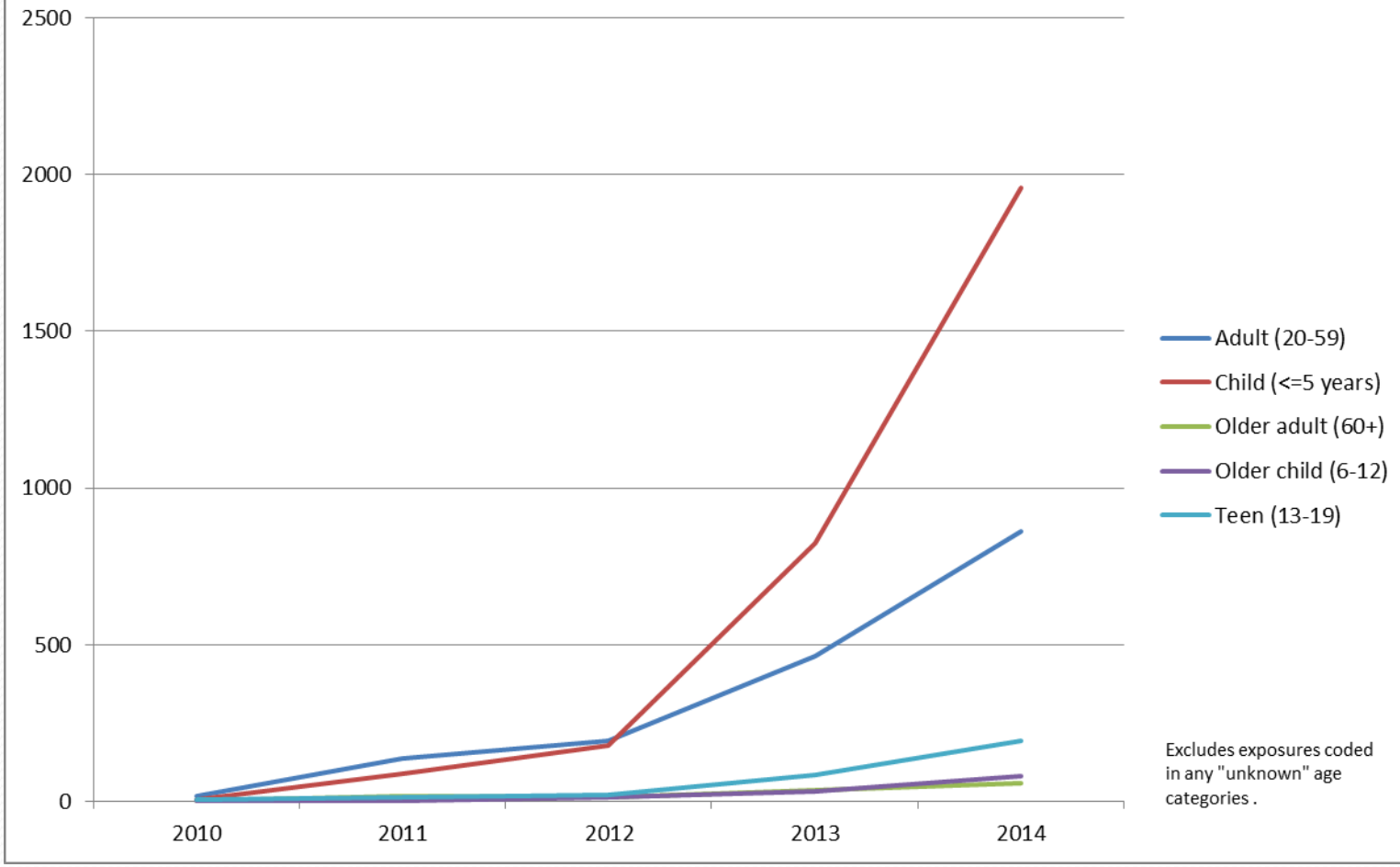
E-Cigarette devices and liquid nicotine exposures reported to Poison Centers: Jan. 1, 2010 through Oct. 31, 2014



	2010	2011	2012	2013	2014
Adult (20-59)	18	135	193	464	860
Child (<=5 years)	7	87	176	824	1959
Older adult (60+)	1	16	12	37	58
Older child (6-12)	0	3	12	32	79
Teen (13-19)	4	11	20	85	192

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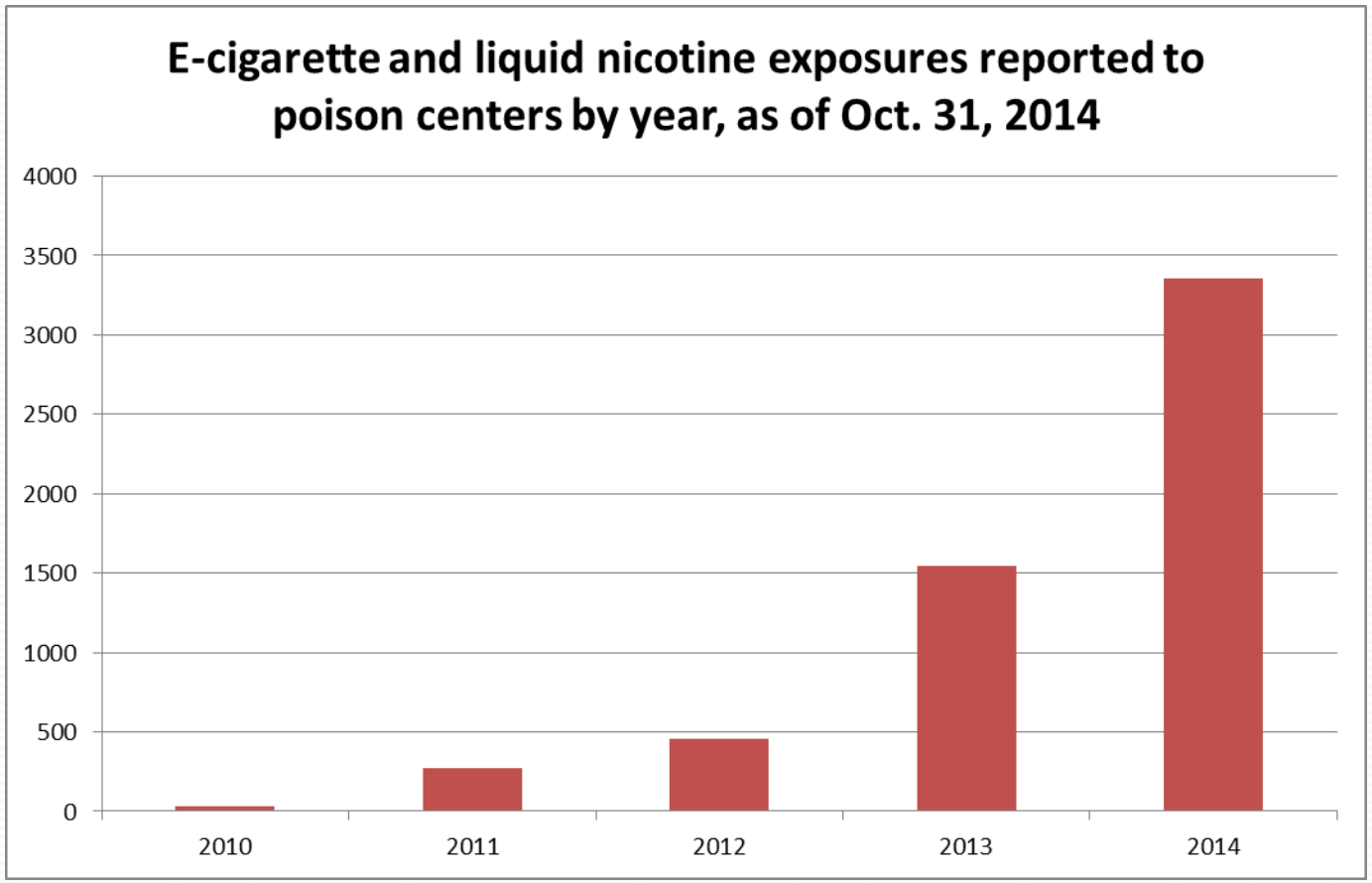

Year	2010	2011	2012	2013	2014
Cases	31	271	460	1543	3353

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Calls to PCs for exposures to e-cigs--United States, September 2010-February 2014 (CDC, April 2014)

- PCs reported 2,405 e-cig and 16,248 cigarette exposure calls from September 2010 to February 2014.
- Total number of poisoning cases is likely higher than reflected in this study because not all exposures are reported to PCs.
- Number of calls to PCs involving e-cig liquids containing nicotine rose from 1/month in September 2010 to 215/month in February 2014.
- 51.1 % of the calls to PCs due to e-cigs involved young children <5y, and about 42% of the poison calls involved people age 20 and older.
- Comparing total monthly PC calls involving e-cigs and conventional cigarettes, proportion of e-cig calls jumped from 0.3% in September 2010 to 41.7% in February 2014.
- Poisoning from conventional cigarettes generally due to young children ingesting them. Poisoning related to e-cigs involves the liquid containing nicotine used in the devices.
- Exposure occurs via ingestion, inhalation or absorption through the skin or eyes.
- E-cig calls were more likely than cigarette calls to include a report of an adverse health effect following exposure. The most common- vomiting, nausea and eye irritation.

Chatham-Stephens K, Law R, Taylor E, Melstrom P, Bunnell R, Wang B, Apelberg B, Schier JG; Centers for Disease Control and Prevention (CDC). Notes from the field: calls to poison centers for exposures to electronic cigarettes--United States, September 2010-February 2014. MMWR Morb Mortal Wkly Rep. 2014 Apr 4;63(13):292-3. PubMed PMID: 24699766.
http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6313a4.htm

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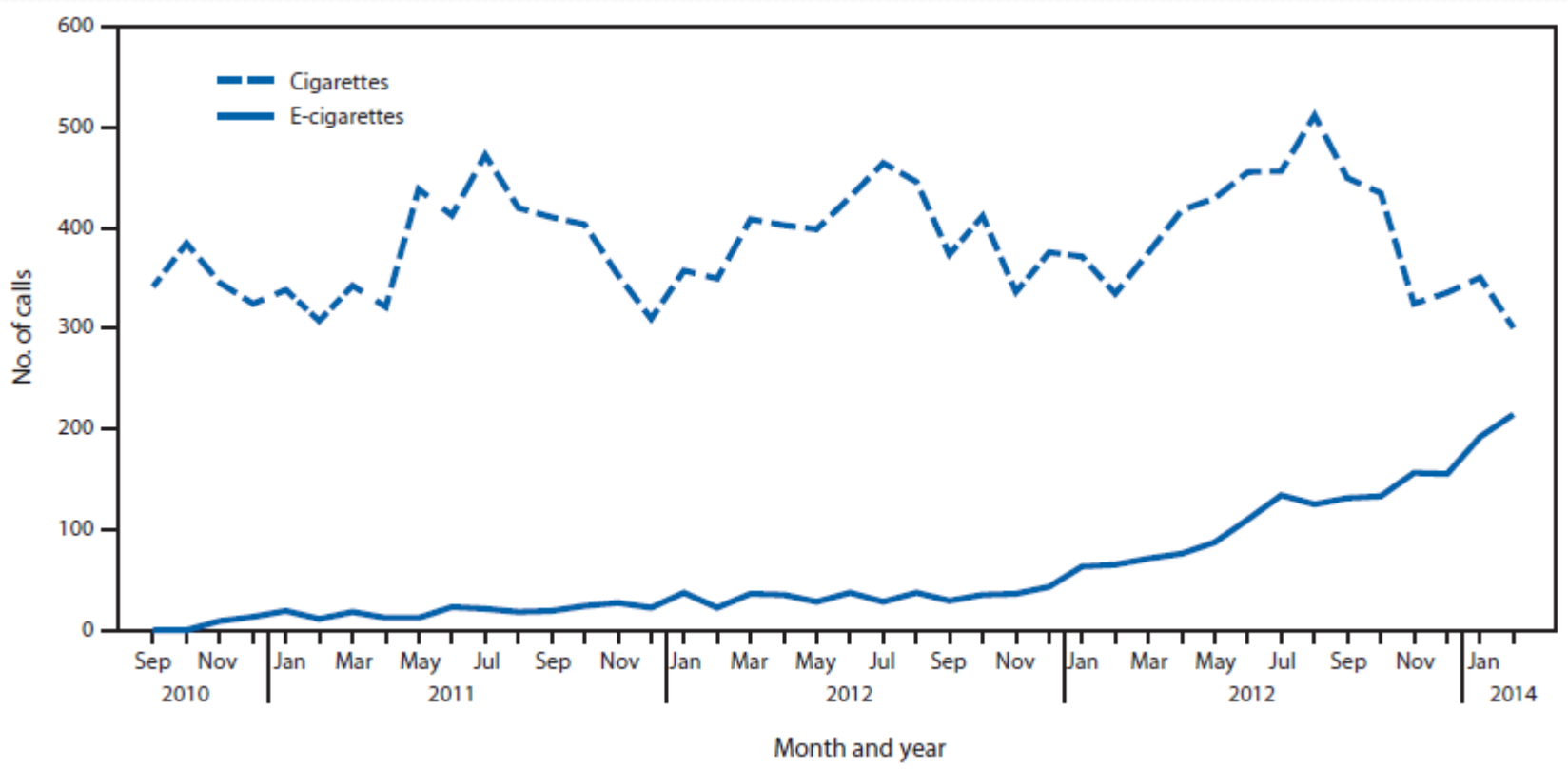
Calls to PCs for exposures to e-cigs--United States, September 2010-February 2014 (CDC, April 2014)



Chatham-Stephens K, Law R, Taylor E, Melstrom P, Bunnell R, Wang B, Apelberg B, Schier JG; Centers for Disease Control and Prevention (CDC). Notes from the field: calls to poison centers for exposures to electronic cigarettes--United States, September 2010-February 2014. MMWR Morb Mortal Wkly Rep. 2014 Apr 4;63(13):292-3. PubMed PMID: 24699766. http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6313a4.htm

Also see :

Vakkalanka JP, Hardison LS Jr, Holstege CP. Epidemiological trends in electronic cigarette exposures reported to U.S. Poison Centers. Clin Toxicol (Phila). 2014 Jun;52(5):542-8. doi: 10.3109/15563650.2014.913176. Epub 2014 May 5. PubMed PMID: 24792781.

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How Poison Centers Manage Exposures

- When SPIs (Specialists in Poison Information) at PCs manage cases they use a products database* to classify what substances are involved in each case.
- Products database contains entries for several hundred thousand products ranging from viral and bacterial agents to commercial chemical and drug products.
- PCs keep appropriate cases out of EDs by using information about the products in the database to establish thresholds for sending to an exposed individual to the ED vs. treating at home with follow up.

*Products database is maintained and continuously updated by data analysts at the Micromedex Poisindex ® System (Micromedex Healthcare Series [Internet database]. Greenwood Village, CO: Truven Health Analytics).

POISON Help 1-800-222-1222 AAPCC

Products Database & Nicotine

- *One regular cigarette contains 15 to 30 mg nicotine*
- *One low nicotine cigarette contains 3 to 8 mg nicotine*
- *One cigarette butt contains 3.75 to 7 mg nicotine*
- *One cigar contains 15 to 40 mg nicotine*
- *One gram snuff (wet) contains 12 to 16 mg nicotine*
- *One gram chewing tobacco contains 6 to 8 mg nicotine*
- *One piece of nicotine chewing gum contains 2 or 4 mg nicotine*
- *One nicotine patch contains 8.3 to 22 mg nicotine*
- *One nicotine nasal spray contains 0.5 mg nicotine*

- Nicotine levels in e-liquids varies. Most range 1.8-2.4%, concentrations that can cause sickness, but rarely death, in children. But higher concentrations are widely available on the Internet.[1]

- Children who ingest 0.5mg/kg will likely remain asymptomatic.
- Children who ingest 0.8mg/kg will likely develop mild symptoms.
- Severe toxicity has been seen in children ingesting 1.4-1.9mg/kg.
- **The window between "safe" and "unsafe" exposure is very small.**
- For example, a small child weighing 25 lbs would only need to ingest 9mg of nicotine to fall into the "mild tox" category. The case would jump to the "severe tox" category if they ingest 15mg of nicotine.

Many thanks to Angel Bivens at the Maryland Poison Center (http://mdpoison.com/) for her help obtaining this information and the example.

PCs and E-cig Exposures

- Difficult for PCs to assess the danger when a child is exposed to e-juice because we don't know how much nicotine or what other chemicals are in each type of e-juice.
- Some PCs report that none of the brand names they have looked for are in the products database, so SPIs are at the mercy of the package or website when trying to figure out nicotine content.
- Often the package is vague; might say it contains 24mg of nicotine, but is that in the whole cartridge or is that 24mg/ml?
- In one study that looked at the nicotine content and vapor delivery of e-juice cartridges and refill solutions, nicotine amounts in 9 out of 20 of the analyzed cartridges differed by more than 20% from values declared by their manufacturers. The differences of the same magnitude were detected among 3 out of 15 nicotine refill solutions.[1]

1. Maciej L. Goniewicz, Tomasz Kuma, Michal Gawron, Jakub Knysak, and Leon Kosmider. Nicotine Levels in Electronic Cigarettes. Nicotine Tob Res (2013) 15 (1): 158-166 first published online April 22, 2012 doi:10.1093/ntr/nts103

Poison Centers and E-cigs: Public Education Efforts

- Many fact sheets, newsletters, and posts on social media.
- Press conferences, and television, radio, and print interviews.
- Working with state and local health departments and other organizations.
- Development of public education materials like posters.
- Examples:
  - http://www.mdpoison.com/media/SOP/mdpoisoncom/publications/pppress/2013/PPPress_E-CigarettesNicotine_SeptOct-2013.pdf
  - http://poisoncontrol.uchc.edu/pdfs/flyer_liquid_nicotine_facts.pdf
  - http://www.wapc.org/toxic-trends/e-cigarettes-you-4/

- Call 1-800-222-1222 to get in touch with your local poison center. Ask for an educator if you're interested in helping with his or her regional poison prevention awareness efforts.

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AAPCC and E-cigarettes

- *November 18, 2014:* "New E-Cigarette Poisoning Data Reinforce Need for Immediate Government Action to Protect Children" (http://www.aapcc.org/press/36/)
- *July 11, 2014:* "AAPCC Issues Statement on the Introduction of the Child Nicotine Poison Prevention Act of 2014" (http://www.aapcc.org/press/30/)
- *March 25, 2014:* "AAPCC and Poison Centers Issue Warning About Electronic Cigarette Devices and Liquid Nicotine" (http://www.aapcc.org/press/29/)

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Thank you!

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Preventing E-Cigarette Poisoning among Children and Youth

Mike Freiberg, J.D.

Children's Safety Network Webinar

December 11, 2014

Tobacco Control Legal Consortium

Road Map for this Presentation

- My Organization
- Federal Regulation of E-Cigarettes and E-Liquid (Liquid Nicotine)
- Policy Considerations
- State and Local Regulation of E-Liquid
- Other Policy Options

Tobacco Control Legal Consortium

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The legal network for tobacco control policy change.

Public Health Law Center
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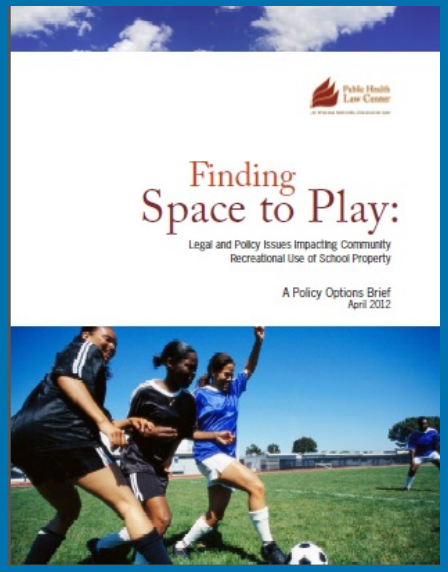
Healthy Eating & Active Living

- Playground Safety in Child Care Licensing Laws
- Active Recreation and Transportation
- Liability and Risk Management



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- Private Attorneys and Individual Citizens
- CDC Grantees and Project Officers
- Other Public Health Professionals

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Disclaimer

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Federal Regulation of E-Cigarettes

- *Sottera v. FDA* (D.C. Cir. 2010)
- Family Smoking Prevention and Tobacco Control Act of 2009

  "This chapter shall apply to all cigarettes, cigarette tobacco, roll-your-own tobacco, and smokeless tobacco and to any other tobacco products that the Secretary by regulation deems to be subject to this chapter." *21 U.S.C. § 387a(b)*

- Proposed Deeming Regulation (April 25, 2014)

  Doesn't address e-liquid packaging

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Federal Regulation of E-Cigarettes

- December 10-11, 2014: FDA Workshop on e-cigarettes, focusing on product science, product packaging, constituent labeling, and environmental impact.
- Docket for public comments (Docket No. FDA-2014-N-0001-0079), closing April 15, 2015

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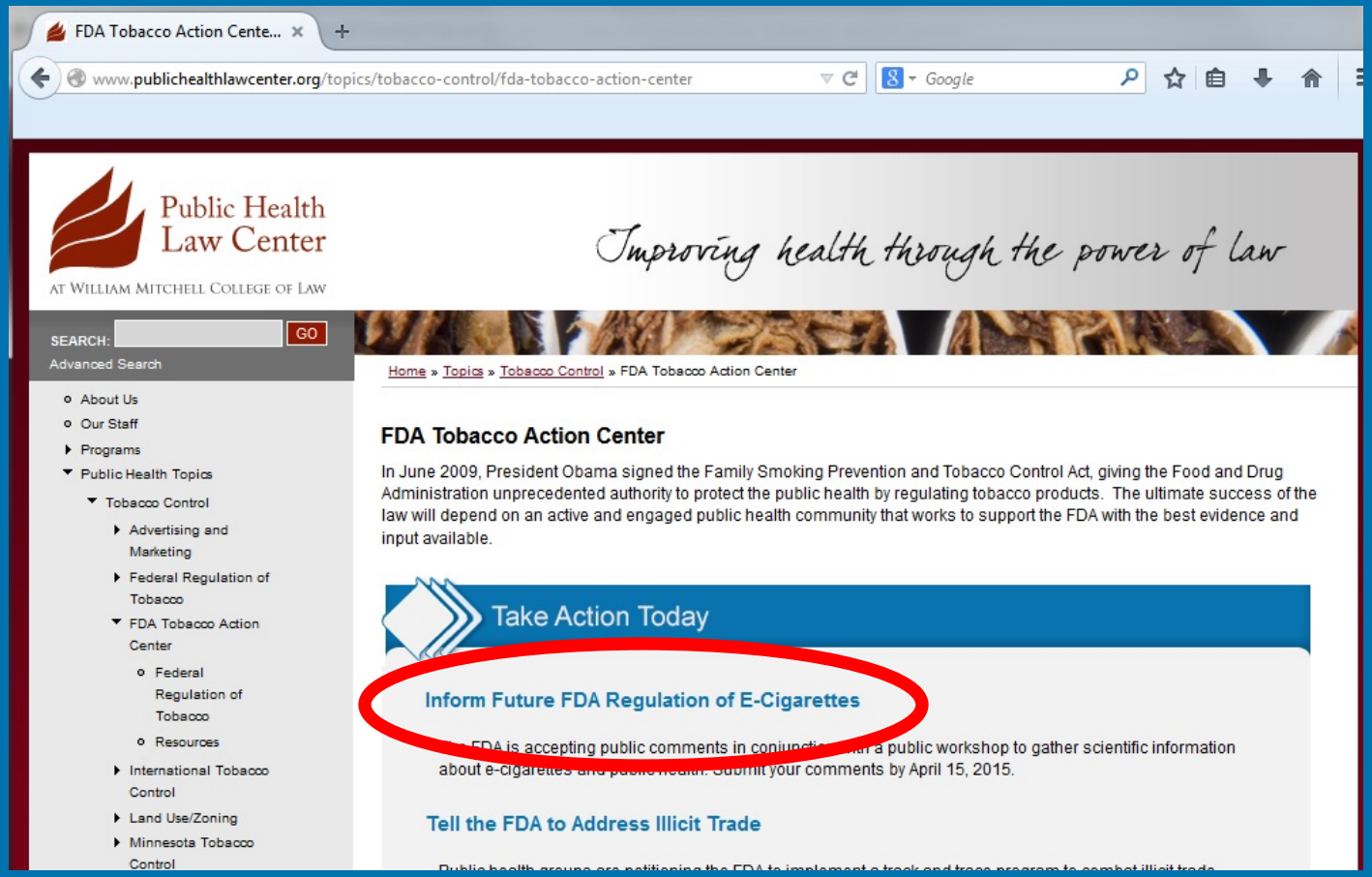
Federal Regulation of E-Cigarettes



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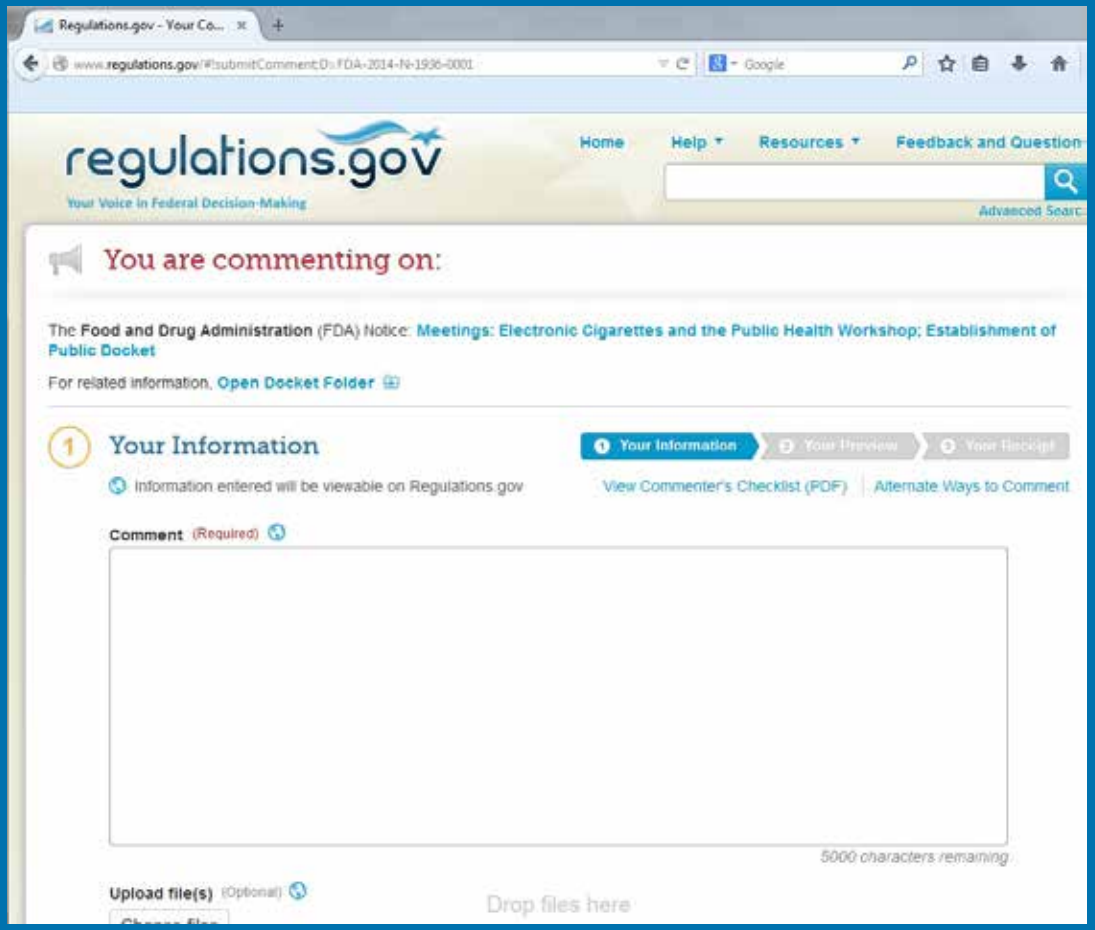
Federal Regulation of E-Cigarettes



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Policy Considerations

- Know Your Authority (Preemption)
- Definitions
- Exemptions
- Penalties and Enforcement
- Rulemaking
- Non-preemption

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S. 2581

SECTION 1. SHORT TITLE. This Act may be cited as the ``Child Nicotine Poisoning Prevention Act of 2014 … A BILL … To require the Consumer Product Safety Commission to promulgate a rule to require child safety packaging for liquid nicotine containers, and for other purposes.

The term “special packaging” means packaging that is designed or constructed to be significantly difficult for children under five years of age to open or obtain a toxic or harmful amount of the substance contained therein within a reasonable time and not difficult for normal adults to use properly, but does not mean packaging which all such children cannot open or obtain a toxic or harmful amount within a reasonable time. *15 U.S.C. § 1471(4).*

The term ``liquid nicotine container'' means a … container that: (A) has an opening that is accessible through normal and reasonably foreseeable use by a consumer; and (B) is used to hold liquid containing nicotine in any concentration.

Savings clause.--Nothing in this section shall be construed to limit or diminish the authority of the Food and Drug Administration to regulate the manufacture, marketing, sale, or distribution of liquid nicotine, liquid nicotine containers, electronic cigarettes, or similar products that contain or dispense liquid nicotine.

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Illinois

Electronic cigarette liquids sold and marketed for the refilling of e-cigarettes may be sold only in special packaging. The Department of Public Health shall adopt rules establishing the standards for special packaging to be used for e-cigarette liquids.

"Special packaging" means packaging that is designed or constructed to be significantly difficult for children under 5 years of age to open or obtain a toxic or harmful amount of the substance contained therein within a reasonable time and not difficult for normal adults to use properly, but does not mean packaging which all such children cannot open or obtain a toxic or harmful amount within a reasonable time.

This Section does not apply to electronic cigarette products sold in sealed, pre-filled, or disposable replacement cartridges.

Effective Date: January 1, 2015

Illinois Public Act 098-1021

Tobacco Control Legal Consortium

Minnesota

(a) For purposes of this section, "child-resistant packaging" is defined as set forth in Code of Federal Regulations, title 16, section 1700.15 (b)(1), … when tested in accordance with the method described in Code of Federal Regulations, title 16, section 1700.20 …

(b) The sale of any liquid, whether or not such liquid contains nicotine, that is intended for human consumption and use in an electronic delivery device, … that is not contained in packaging that is child-resistant, is prohibited. All licensees under this chapter must ensure that any liquid intended for human consumption and use in an electronic delivery device is sold in child-resistant packaging.

(c) A licensee that fails to comply with this section is subject to administrative penalties …

Effective date: January 1, 2015

Minn. Stat. Sec. 461.20

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Vermont

- Liquids or gels containing nicotine and “nicotine liquid containers” must be in child-resistant packaging
- “Child-resistant packaging” means packaging that is designed or constructed to be significantly difficult for children under five years of age to open or obtain a toxic or harmful amount of the substance contained therein within a reasonable time and not difficult for normal adults to use properly, but does not mean packaging which all such children cannot open or obtain a toxic or harmful amount within a reasonable time.
- Exempts containers “containing nicotine in a cartridge that is sold, marketed, or intended for use in a tobacco substitute if the cartridge is prefilled and sealed by the manufacturer and not intended to be opened by the consumer.”
- Effective date: January 1, 2015

7 V.S.A. § 1012

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Davis County, Utah

5.1 E-LIQUID FOR SALE IN DAVIS COUNTY

5.1.1 Packaging – All containers must:

(1) Have child-proof caps;

(2) Be leak-proof at the time of sale;

(3) Be tamper-evident

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Other Policy Options

- Youth Access / Smoke-Free / Tax
- Flavor Ban
- Licensing
- Vape Shop Moratorium

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Questions and Answers

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Q & A

Questions? Please use the Q & A pod on the left.

Evaluation

Please fill out our evaluation:
https://www.surveymonkey.com/r/2GN2DC2