
E-cigarettes and Beyond: Do You Really Know What is in There?

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Outline

- I. Background
- II. E-cigarette products
- III. Beyond E-cigarettes
- IV. Substance abuse and E-cigarettes



Background

- In 2015, poison centers received reports of 3,590 exposures to electronic cigarettes and liquid nicotine (out of 2,231,381 total exposure cases).
 - Just over ½ of these reported exposures occurred in children < 6 years of age
 - Moderate and major effects and death have been documented.
- Increased smoking area restrictions one factor leading to development of these products
- An unregulated market (until May 10, 2016)



2015 High School Survey

- Between 1991 and 2015, use of cigarettes by high school students dropped:
 - 28% in 1991 to 11% in 2015
- Use of E-cigarettes 2015 = 25%
- Use of prescriptions drugs dropped from 20% to 17% (1991 to 2015)



Closed vs. Open Systems

- Closed systems typically:
 - Inexpensive, disposable, look most like cigarettes
 - Easiest to use for those new to E-cigarettes
 - Acts as an entry into the use of open systems
- Open systems add options:
 - Wider range of flavor choices
 - May be more attractive to children and teens
 - Can mix flavors
 - Can customize how the device works
 - More battery power, alterations in how liquid is vaporized
 - Add more heat to use non-nicotine liquids
 - Some would like to ban open systems



The Dose Catch

- Study of 27 e-liquid formulations from USA
 - Nicotine concentrations were 45 to 131% of labeled conc.
 - 18 of 27 had > 10% variation
 - 9 had > 20% variation
 - Propylene glycol:glycerin was usually 50:50 as labeled
 - 4/27 had > 10% variation
 - One had a ratio of 81:19
 - Propylene glycol and glycerin are humectants to keep the nicotine from drying out
 - 1,3-propanediol, ethylene glycol in some products not studied



Toxic potential of non-nicotine ingredients and heavy metals still being determined

Non-Nicotine Liquid Flavors

- Vape Snack (brand name product line)
- Non-Nicotine E-Juice or Nicotine Free E-Juice
- Non-Nicotine Vape Juice



Brand Names Coming



Rapidly Growing Business

- More retail E-cigarette brands coming
 - More push back from on-line retailers; makes on-line information confusing and inconsistent
- More brands showing up with inconsistent labeling (used to get consumers to buy them)
 - No government standard for terminology used for these products
 - E-cigarette, Vapor Pen, E-Hookah

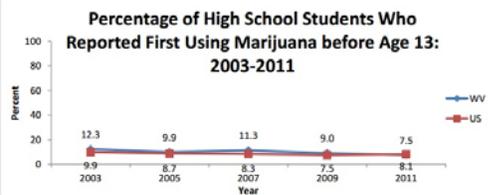


Marijuana: E-cigarettes

- Marijuana, can be added to an open system, E-cigarette device that is modified
 - Modification required in order to obtain the correct heat, vapor stream



Male high school students in West Virginia reported a significantly higher percentage (10.6%) of first use of marijuana before the age of 13 than female high school students (4.3%) (YRBS).



Percentage of High School Students Who Reported First Using Marijuana before Age 13 by Gender and Grade: 2003-2011

| Year | Total | West Virginia | | | | | |
|------|-------|---------------|--------|-----------------|------------------|------------------|------------------|
| | | Gender | | Grade | | | |
| | | Male | Female | 9 th | 10 th | 11 th | 12 th |
| 2003 | 12.3 | 13.6 | 10.9 | 10.7 | 9.5 | 10.8 | 18.9 |
| 2005 | 9.9 | 12.8 | 6.8 | 12.6 | 11.2 | 8.0 | 7.1 |
| 2007 | 11.3 | 15.6 | 6.6 | 13.8 | 12.2 | 9.1 | 9.0 |
| 2009 | 9.0 | 10.5 | 7.0 | 11.8 | 9.2 | 9.6 | 4.6 |
| 2011 | 7.5 | 10.6 | 4.3 | 11.4 | 7.0 | 5.8 | 5.2 |

Novel Ingredients: Change Device

- Non-nicotine drugs can be placed in open system E-cigarettes
 - E-cigarette containing marijuana, etc. used after device modification
- Vaporizer Pens (aka: Vape Pens, Vapor Pens)
 - Makers changed the name to distinguish them from being a device primary used for nicotine (instead, primarily used for cannabis, etc.)
 - Uses same technology as E-cigarettes
 - Used for wax/oil based solutions, or dried "herbs"
- E-Hookah Electronic Pen
 - A vaporizer pen made by a manufacture of hookah products
 - The hookah term is attached for cross-branding purposes
 - Used for water based solutions
 - Primarily advertised for flavor only liquids; used for other liquids as well



Marijuana Pen

- Sold via the Internet; a vaporizer pen designed specifically for marijuana:
- Alterations in battery voltage, heating coils, etc.



Electronic Hookah (aka Hookah Pen)

- Traditional Hookah
 - Tobacco used
 - Tar and smoke produced
 - Frequently, multiple users
 - Vapor smoke desired

Electronic Hookah
Hookah, Pen



E-Hookah Electronic Pen

- Target buyers are young users, therefore:
 - Colorful and "trendy" in design
 - Fruity, candy-like flavors common
 - Promoted for "vaping" flavors only



Electronic Hookah Appearance

- May look just like an E-cigarette
- May not look like an E-cigarette
- May be closed (e.g., disposables) or open system design



Contents Electronic Hookah

- Usually flavored E-juice without nicotine
 - Social enjoyment; not cigarette replacement
- Some contain nicotine
- Some can be altered to contain other drugs (open systems)



Tobacco used in traditional Hookah

“Advanced” Personal Vaporizers

- “Advanced” Personal Vaporizers vs. E-cigarettes
 - Bigger, do not look like traditional cigarette, longer battery life, more flavors and features, promoted as “more consistent nicotine delivery”
 - Liquid heated with warm air instead of directly heating the E-liquid



E-cigars and E-Pipes

- Similar variations and features (disposable or reusable, closed or open, liquid nicotine/flavor only/other drug) as E-cigarettes



Not Always Nicotine or Marijuana



If it Burns, it Can be “Vaped”

- “Bath salt” type drugs (synthetic cathinones/phenylethylamines)
- Synthetic psychedelics (e.g., NBOME series)
 - Salts added to e-liquids then vaped
- Synthetic marijuana (e.g., Spice, K2)
 - Sold as a liquid for vaping, names include:
 - Cloud 9, Hookah Relax, Crown, Bizarro, Shisha, Mad Hatter
 - As liquids names different, those of high school age may not realize what they are “vaping” and underreport use



Why?

- User preferred:
 - Does not burn throat
 - No smoky or chemical smell on clothes
 - Smells good
 - Stronger, more potent high
 - Can conceal use of drugs
- May use alone or mixed with hash oil



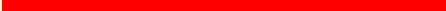
Prevention and Product Safety

- Poison center prevention recommendations for E-cigarette users:
 - Use care to protect the skin when handling E-cigarette devices and refill products
 - Keep devices and refill products out of the sight and out of the reach of children.
 - Dispose of E-cigarette products properly to prevent exposure to pets and children from the residue or liquid left in the container.
- Do not store loose devices in pockets
- Do not allow in schools (pre-school through high school)



E-cigarette Batteries Can Explode





Questions?