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CHILDREN'S ENVIRONMENTAL HEALTH CENTER OF THE HUDSON VALLEY PROTECTING CHILDREN AGAINST ENVIRONMENTAL THREATS

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December 1, 2015– CHILDREN'S HEALTH ADVISORY E-Cigarettes: Prominence, Health Threats, and Regulations

December 2015: With the look and feel of real cigarettes, electronic cigarettes are experiencing a boom in popularity. But as the product's popularity rises, so do the unknowns about its potential impact on public health.

What are Electronic Cigarettes? Electronic cigarettes, also known as e-cigarettes, are battery-operated products designed to deliver nicotine, flavor and other chemicals. They turn chemicals, including highly addictive nicotine, into an aerosol that is inhaled by the user. Most e-cigarettes are manufactured to look like conventional cigarettes, cigars, or pipes. Electronic Cigarettes attract to smokers because they mimic the experience of tobacco cigarettes. These devices provide nicotine to users in the form of an aerosol vapor, which is promoted as a reduced risk form of delivery.

Invented by Lik Hon in Hong Kong in 2003, e-cigarettes are undergoing a rapid evolution. Even though e-cigarettes come in different shapes and colors, most have the same basic design - a plastic tube for holding the battery, vaporizer, airflow sensor, nicotine/flavor cartridge with a chemical for turning liquid to vapor. E-liquid comes in different flavors making them appealing to children, including cotton candy, bubble gum, Atomic Fireball, and popular kids' cereal flavors such as Fruit Loops. One recent study estimated that there are almost 500 different e-cigarette brands today with more than 7700 different flavors. The three major cigarette companies now all sell e-cigarette products. In addition, a 2014 study showed wide-ranging nicotine levels in e-cigarettes and substantial variability between listed and actual nicotine levels in products.

Prominence According to the CDC more than 16 million children aged 17 and under live in states where they can buy e-cigarettes legally, and a 2013 National Youth Tobacco Survey of middle and high school students showed that e-cigarette use was up across the board among white, black and Hispanic high school students. The greatest increases from 2012 to 2013 were among blacks, with use more than doubling from 1.1 percent to 2.7 percent. E-cigarette use was highest among Hispanics at 5.3 percent, which was a substantial increase from the 2012 rate of 2.7 percent. CDC also found that 12.6 percent of high school students are using two or more tobacco products.

Health Threats E-cigarettes have not been fully studied, so consumers currently don't know the potential risks when used as intended, how much nicotine or other potentially harmful chemicals are being inhaled during use, or whether there are any benefits associated with using these products.

So far, evidence suggests that e-cigarettes may be safer than regular cigarettes. The biggest danger from tobacco is the smoke, but e-cigarettes don't burn. Tests show the levels of dangerous chemicals they give off are a fraction of what you'd get from a real cigarette. But what's in them can vary. A previous study found that cells exposed to high-nicotine vapor expressed a similar pattern of gene expression as those cells exposed to tobacco. Opponents say that because nicotine is addictive, e-cigarettes could be a "gateway drug," leading nonsmokers and kids to use tobacco. Others look at possible benefits for smokers: if it is hard to quit smoking, they'd be a lot better off with e-cigarettes because they are a safer alternative.

However many teens are replacing the nicotine oil with marijuana leaves, oils, or waxes. Many of the e-cigarettes can be purchased with interchangeable heating elements to conform to the type of product which is being heated up inside of them. The e-cigarettes, vapes, or pen doesn't carry the same stigma as smoking a rolled marijuana joint does. Adults may be thinking the teen is smoking nicotine when in fact they are using marijuana.

Research indicates vaping (as an alternative to smoking) has fewer risks than traditional smoking; however it's still dangerous, especially for adolescents.

While e-cigarettes and other electronic nicotine delivery systems (ENDS) may have the potential to benefit established adult smokers if used as a complete substitute for all smoked tobacco products, their use by youth and adult non-tobacco users can have harmful effects due to the exposure to nicotine, which is an addictive substance that can harm adolescent brain

development, and due to the exposure to known cancer-causing substances and other toxic chemicals. The adverse events of smoking e-cigarettes reported to the FDA by consumers and health professionals have included pneumonia, congestive heart failure, disorientation, seizures, hypotension and other health problems.

Regulation Forty states have enacted laws prohibiting the sale of electronic nicotine delivery systems (ENDS), including e-cigarettes, to minors, however, 10 states and the District of Columbia still permit such sales.

In September 2008, The World Health Organization (WHO) announced that it does not consider electronic cigarettes to be legitimate smoking cessation aid.

In April 2014, the U.S. Food and Drug Administration proposed to extend its authority to cover additional tobacco products including electronic cigarettes. The FDA currently only regulates cigarettes, cigarette tobacco, roll-your-own tobacco, and smokeless tobacco. If the FDA rule is adopted as proposed, these products would now be subject to the federal prohibition on sales to minors, the federal prohibition on free sampling, federal warning label requirements, and the requirement that tobacco manufacturers register with the FDA and seek the agency's review of new tobacco products

In 2013, cities including San Francisco, Los Angeles, Chicago and New York enacted laws that treat the devices much like traditional cigarettes, meaning they can't be used where smoking is banned. Additionally on January 28, 2015, California health officials declared electronic cigarettes a health threat that should be strictly regulated like tobacco products.

A Bill has been passed by Westchester County that states electronic cigarettes should be regulated like any other tobacco product.

For More Information:

1. <http://www.cdc.gov/tobacco/campaign/tips/resources/data/cigarette-smoking-in-united-states.html>
2. <http://www.fda.gov/NewsEvents/PublicHealthFocus/ucm172906.htm>
3. <http://www.webmd.com/smoking-cessation/features/electronic-cigarettes>

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2. Chapman, S. L. C., & Wu, L.-T. (2014). E-Cigarette Prevalence and Correlates of Use among Adolescents versus Adults: A Review and Comparison. *Journal of Psychiatric Research*, 54, 43–54. doi:10.1016/j.jpsychires.2014.03.005
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9. APHA. The Nation's Health: Research on e-cigarettes examining health effects: Regulations due. July 2013 vol. 43 no. 5 1-10. Available at: <http://thenationshealth.aphapublications.org/content/43/5/1.2.full>, <http://www.fda.gov/NewsEvents/PublicHealthFocus/ucm172906.htm>
10. CDC (2014) More than 16 million children live in states where they can buy e-cigarettes legally. Press release December 11, 2014. Available at: <http://www.cdc.gov/media/releases/2014/p1211-e-cigarettes.html>
11. Change Lab Solutions. Are E-Cigarettes Regulated by the FDA? Last updated May 2014. Available at: <http://changelabsolutions.org/tobacco-control/question/are-e-cigarettes-regulate>
12. FDA (2014). FDA proposes to extend its tobacco authority to additional tobacco products, including e-cigarettes. FDA New Release April 14, 2014. Available at: <http://www.fda.gov/NewsEvents/Newsroom/PressAnnouncements/ucm394667.htm>