ELECTRONIC CIGARETTES AND TOBACCO PRODUCTS: HIDDEN DANGERS AND IMPLICATIONS FOR PUBLIC HEALTH

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The Beginning of ENDS

- Early designs for a smokeless, non-tobacco cigarette originated as early as the 1960s
- In 2003, Chinese Pharmacist, Hon Lik, created the first commercially successful electronic cigarette after his father, a heavy smoker, died of lung cancer
- Introduced to the United States by 2007

https://www.youtube.com/watch?v=fNXW2RZ4LZc
What are ENDS?

- Battery-powered devices that people use to inhale an aerosol, which may contain nicotine, flavorings, and other chemicals

- Usually consist of:
  - a cartridge or reservoir, which holds a liquid solution
  - a heating element (atomizer)
  - a power source (usually a battery)
  - a mouthpiece that the person uses to inhale

National Institutes on Drug Abuse-
INSIDE THE E-CIGARETTE

Cartridge stores nicotine in a chemical solution of either propylene glycol or glycerine and water.

Atomiser

Battery

Microprocessor activates the LED as you inhale.

LED illuminates.

Mouthpiece

A heating element vapourises the liquid delivering a hit of nicotine straight into the lungs as the smoker inhales.
First Generation: “Cig-a-Like”

- Designed to look and feel like traditional cigarettes
- Consisted of a battery, atomizer, and cartridge
- Disposable

Second Generation: Mid-size E-Cigs

- Larger and typically do not resemble a cigarette
- Large, have separate cartridges ("tanks") for liquids and flavorings
- Larger-capacity and rechargeable batteries, larger atomizers, and more powerful electronic circuits

Third Generation: Advanced Personal Vaporizers

- Generally larger and more customizable and contain a range of different cartridge, atomizer, and battery options

- Cartomizers produce higher heating element temperatures, generating more heat and affecting the amount and quantity of the aerosol

- Overheating has been a problem

Who is Using Electronic Cigarettes?
Estimated Percentage of Middle School Students who Currently use any Tobacco Products, 2011–2016

Estimated Percentage of High School Students who Currently use any Tobacco Products, 2011–2016

Trends in Ever E-cigarette Use among U.S. Middle and High School Students; National Youth Tobacco Survey (NYTS) 2011–2015

Note: In 2014, modifications were made to the e-cigarette measure to enhance its accuracy, which may limit the comparability of this estimate to those collected in previous years. The dotted lines from 2013 to 2015 represent these differences. Includes those who responded “1 or more” for the following question: “During the last 30 days, on how many days did you use electronic cigarettes or e-cigarettes?”
ENDS and Youth

- Current use of electronic cigarettes increased among middle and high school students from 2011 to 2016

- About **4 of every 100 middle school students (4.3%)** reported in 2016 that they used electronic cigarettes in the past 30 days—**an increase from 0.6% in 2011**

- About **11 of every 100 high school students (11.3%)** reported in 2016 that they used electronic cigarettes in the past 30 days—**an increase from 1.5% in 2011**

Includes those who responded “electronic cigarettes or e-cigarettes” to the following question, “Have you ever tried any of the following products, even just one time? Electronic cigarettes or e-cigarettes, such as Ruyan or NJOY?”
What’s in E-Cigarette Aerosol?
What Teens Think is in their E-Cigarette Aerosol

WHAT DO TEENS SAY IS IN THEIR E-CIG?

- 66.0% Just Flavering
- 13.7% Don’t Know
- 13.2% Nicotine
- 5.8% Marijuana
- 1.3% Other

What’s Really in E-Cigarette Aerosol

- The e-cigarette aerosol that users breathe from the device and exhale can contain harmful and potentially harmful substances, including:
  - Nicotine
  - Ultrafine particles that can be inhaled deep into the lungs
  - Flavoring such as diacetyl
  - Volatile organic compounds (e.g. Benzene)
  - Cancer-causing chemicals
  - Heavy metals (e.g. nickel, tin, and lead)

Teacher Talking Points:

- (click) All of these chemicals have been found in the e-cigarette/vape pen Aerosol.
- (click) The ones in yellow are known to be harmful.
- And while we did not know this at first, Many of these are the same chemicals found in traditional cigarettes.
- Simply put, E Cigs produce a vapor/aerosol that often contain propylene glycol, glycerin, flavorings, and nicotine and many other harmful chemicals and toxins, some known to cause cancer.
- Nicotine itself is a highly addictive compound.
- And while not all contain nicotine, all have many of these chemicals and toxins.
Nicotine

- Most e-cigarettes contain nicotine, which has known health effects
  - Nicotine is highly addictive
  - Affects ability to pay attention, reason, learn, control impulses
  - Nicotine is toxic to developing fetuses
  - Nicotine can harm adolescent brain development

Nicotine Poisonings

Poison center calls involving e-cigarettes

215 Calls per Month

September 2010 - February 2014

CDC
# of Nicotine exposures/poisonings by year due to nicotine found in e-juice

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of Cases</th>
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<td>2,454</td>
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TEEN E-CIG USERS ARE MORE LIKELY TO START SMOKING.²

Start Smoking Within 6 Months

30.7% E-CIG USER
8.1% NON USER

Includes combustible tobacco products (cigarettes, cigars, and hookahs)

Flavorings

- Numerous flavorings used in electronic cigarettes

- The flavorings are generally recognized as safe ("GRAS") for ingestion, but not for inhalation
People who have frequently been exposed to theatrical fogs containing propylene glycol are more likely to suffer from respiratory, throat and nose irritations than do unexposed people.

It is a solvent for food colors and flavors, and in the paint and plastics industries.
that causes a scarring of the tiny air sacs in the lungs resulting in the thickening and narrowing of the airways
Research studies of workers exposed to formaldehyde have suggested an association between formaldehyde exposure and several cancers, including nasopharyngeal cancer and leukemia.

2-and as a probable human carcinogen by the U.S. Environmental Protection Agency.
EPA has classified cadmium as a Group B1, probable human carcinogen
Other Risks Associated with E-Cigarettes
E-Cig Explosions

- Between 2009-2016, 195 separate incidents of explosion and fires involving an electronic cigarette were reported by the U.S. media.

- The shape and construction of electronic cigarettes can make them more likely than other products with lithium-ion batteries to behave like “flaming rockets” when a battery fails.

Sixty-one incidents occurred when either the device or spare batteries for the device were in a pocket.

* Sixty incidents occurred while the device was being used.
* Forty-eight incidents occurred while the battery in the device was being charged.
* Eighteen incidents occurred while the device or battery was stored.
* In seven incidents, it is not reported whether the e-cigarette was in use, stored, or being charged.
* One incident occurred during transportation on a cargo aircraft.
In 91 incidents, the fire spread was minor, meaning that the scorching or flames either self-extinguished or were extinguished very quickly by persons nearby. Typically, in these incidents, the burned areas were 6 inches or less in diameter.

In 27 incidents, the fire spread was moderate, where the burned area was larger than 6 inches in diameter, but the fire was extinguished by occupants before the fire department arrived.

In 10 incidents, the fire spread was major and involved significant portions of a building, and required suppression by the fire department. Typically, these incidents are what the fire service refers to as “room and contents” type fires, or larger.

In 67 of the incidents (34 percent), there was no fire spread, or fire spread was not evident in the reports reviewed.
Thirty-eight of the incidents resulted in severe injury to an individual, meaning that the victim required hospitalization, and may have suffered loss of a body part, 3rd degree burns, or facial injuries.

Eighty victims suffered moderate injuries, which were defined as persons requiring treatment in the emergency room for smoke inhalation, 2nd degree burns, or lacerations requiring stitches. Typically, incidents reported as moderate injuries did not require admission to the hospital.

Press in the United Kingdom has reported one death in an August 2014 incident where an e-cigarette that was being charged in a non-manufacturer approved device exploded and ignited nearby oxygen equipment.

Electronic Cigarette Fires and Explosions in the United States 2009 - 2016

Fifteen individuals suffered minor injuries, including smoke inhalation, minor lacerations, or 1st degree burns. Emergency room treatment may or may not have been provided.

No injuries were reported in 62 (32 percent) of the incidents.
Trends in Advertising
E-Cigarette Advertising and Youth

Youth are exposed to e-cigarette advertisements from multiple sources.

**Sources of e-cigarette advertisement exposure**

- **14.4 MILLION** youth are exposed at retail stores
- **10.5 MILLION** youth are exposed through the Internet
- **9.6 MILLION** youth are exposed through TV/online
- **8 MILLION** youth are exposed through magazines/newspapers

US students exposed to e-cigarette advertisements, by school type and number of sources of exposure

*Percentage may not add up exactly to any source due to rounding.*

E-Cigarette Advertising and Youth

E-cigarette use among youth is rising as e-cigarette advertising grows

Dollars spent on e-cigarette advertising
Past 30-day e-cigarette use among youth

They sponsor sports ...  

... and music festivals
Their ads say, “Switch, Don’t Quit.”
LET’S TAKE THIS INSIDE

EQUAL TO 36 PACKS OF CIGARETTES!

Larger Capacity than any other e-cigarette in the market between charges, making Vapesnake the ultimate e-smoker.

With up to 12 hours of usage, it's a true smoke free vaporizer to suit your needs.

Conveniently comes to easily with the cigarette case, just replace and pour it in.

Watch the video.
Point-of-Sale Audits in Essex and Passaic Counties

- Looked at advertising and pricing patterns among South Orange and Clifton tobacco retailers near schools

- 49 out of 59 tobacco retailers were located within ¼ of a school

- 29 out of 49 tobacco retailers near a school displayed exterior advertising

- Both highest/lowest priced e-cigarettes were sold for cheaper prices at tobacco retailers near a school

- At tobacco retailers near schools, even cheapest cigarettes were sold for higher prices than those within 4+ blocks from a school
1. Flavors like “Thin Mint” and “Tropical Punch” make tobacco seem safe and fun
2. Many tobacco products have colorful, eye-catching packaging that appeals to youth (and looks an awful lot like candy)
3. With FDA having yet to regulate little cigars, it is a perfect outlet for tobacco companies to use sweet flavors to market to youth in and around convenient stores
FDA Regulation of E-Cigarettes
If a company makes, modifies, mixes, manufactures, fabricates, assembles, processes, labels, repacks, relabels, or imports ENDS, it must
FDA Regulation of E-Cigarettes: Retailers

- Check photo ID of everyone under age 27 who attempts to purchase e-cigarettes or other ENDS
- Only sell e-cigarettes and other ENDS to customers age 21 and older
- Do NOT sell e-cigarettes or other ENDS in a vending machine unless in an adult-only facility
- Do NOT give away free samples of e-cigarettes or other ENDS to consumers, including any of their components or parts

Beginning August 10, 2018,
- Do NOT sell or distribute e-cigarettes or other ENDS without a health warning statement on the package
- Do NOT display advertisements for e-cigarettes or other ENDS without a health warning statement
What is the Clifton Health Department doing about Vaping?
Education
Enforcement

Little Falls adopts ordinance to regulate electronic smoking and vapor devices

Lindsey Kelkner, Staff Writer, @lindseylkelkner

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LITTLE FALLS — Vendors now need a permit from the township before they can sell electronic smoking or vapor devices.

The Township Council adopted an ordinance this week requiring vendors to obtain a license before they start selling e-cigarettes and vapor devices.

Licenses would be issued by the Clifton Health Department, which shares its services with Little Falls. Vendors looking to set up an operation in Little Falls would be required to appear before the Little Falls Township Council before they are issued a license. Vendors will also be required to pay a fee for selling these products.

The ordinance was adopted in response to a recommendation made by the Clifton Health Department.

Township officials hope the new ordinance will discourage the sale of electronic smoking and vapor devices to individuals who want to get a high off of the liquid nicotine found in them. Their goal is to control and monitor how the electronic devices are sold and used.

"Kids are getting a new high by drinking the liquid out of the bottles," said Little Falls Mayor James Damiano during a workshop council meeting Feb. 13.
What Other Cities in NJ are Doing about Vaping

Community Corner
Wayne Set To Up Vape Purchasing And Smoking Age To 21

MONTGOMERY: Ordinance proposed to license stores that sell tobacco, e-cigarettes

Business
Highland Park Cracking Down on e-Cigarettes
Want to open a vape shop there? You'll have to buy a license first.

North Jersey schools crack down on vaping with drug testing, suspensions

Joleen Agnish, Staff Writer, @joleenagnish
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E-Cigarettes: A Growing Trend

- Good Guy Vapes-Clifton:
  - [https://www.youtube.com/watch?v=JU1SpzNTVSg](https://www.youtube.com/watch?v=JU1SpzNTVSg)

- Good Guy Vapes-East Brunswick:
  - [https://www.youtube.com/watch?v=qnf_eMLCOEg](https://www.youtube.com/watch?v=qnf_eMLCOEg)
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