

CLOUD CHASING

A CLOSER LOOK AT
THE E-CIGARETTE EPIDEMIC



South Central Public Health District

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Cloud Chasing

A Closer Look at the E-Cigarette Epidemic

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2021

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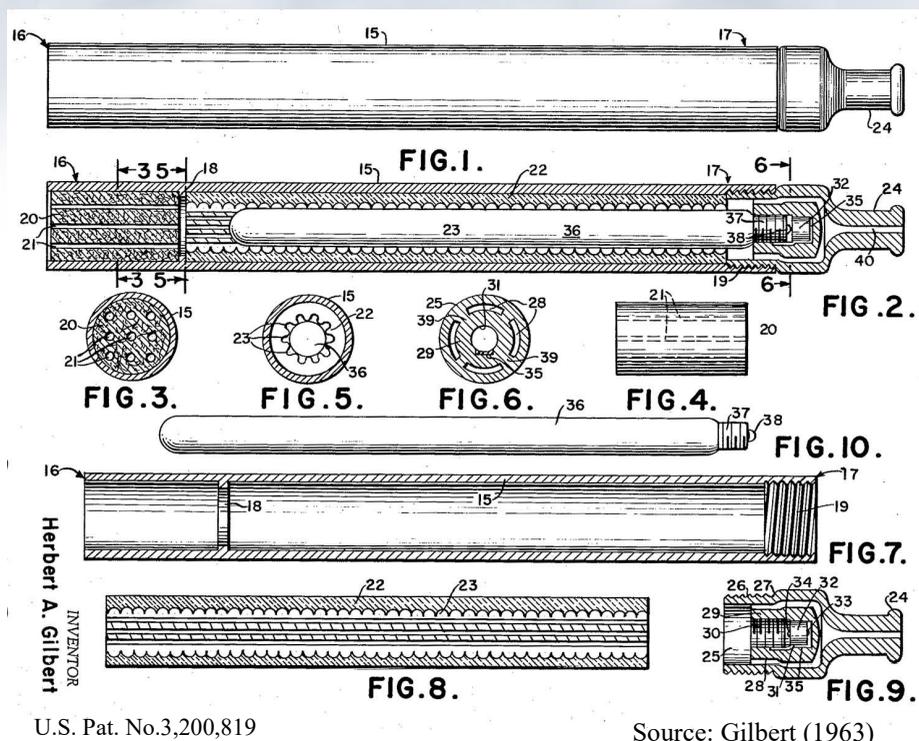


Source:123RF, [tumsasedgars]

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HISTORY



U.S. Pat. No.3,200,819

Source: Gilbert (1963)

An early approximation of the current e-cigarette appeared in a U.S. Patent application submitted in 1963 by Herbert A Gilbert and was patented in August 1965. The application was for a “smokeless nontobacco cigarette,” with the aim of providing “a safe and harmless method of smoking” by replacing tobacco and paper with heated, moist, flavored air. A battery-powered heating element would heat the flavor chemicals without combustion.

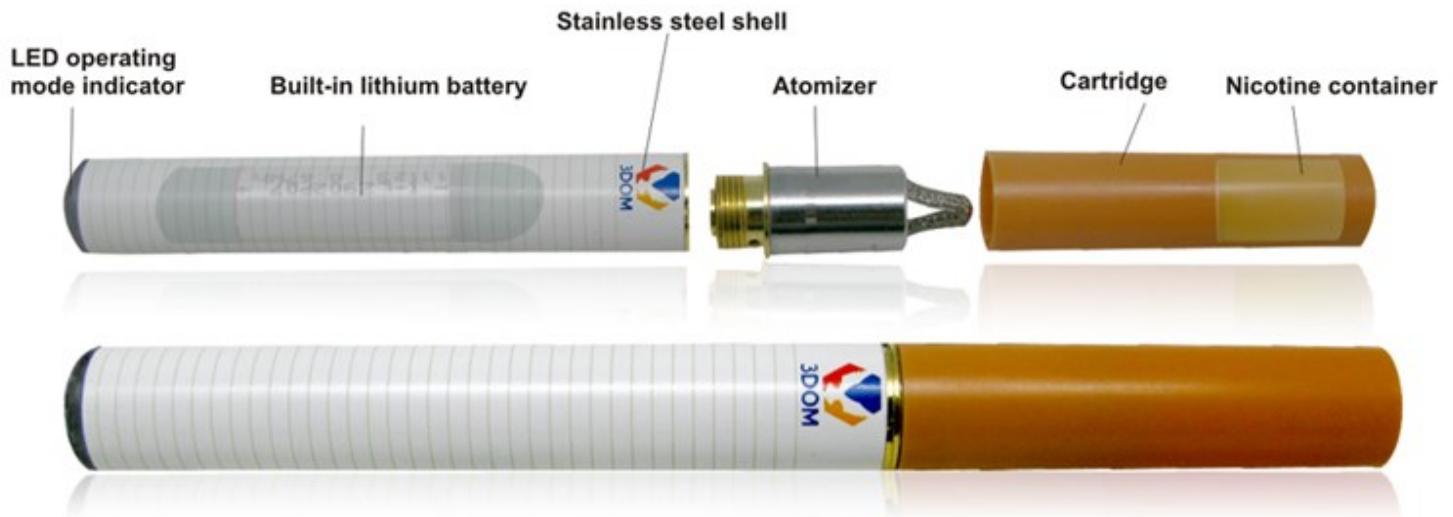
The first modern e-cigarette was developed in 2003 by the Chinese pharmacist, Hon Lik, a former deputy director of the institute of Chinese Medicine in Liaoning Province. Lik’s patent application described a kind of electronic atomizing cigarette.

With support from Chinese investors, in 2004 the product was introduced on the Chinese market under the company name Ruyan. The product gained some attention among Chinese smokers early on as a potential cessation device or an alternative cigarette product. The e-cigarette was part of the U.S. Market by the mid-2000s and by 2010 additional brands started to appear in the nation’s marketplace, including Ruyan and Janty.

In August 2013, Imperial Tobacco Group purchased the intellectual property behind the Ruyan e-cigarette for \$75 Million. As of 2014 an estimated 90% of the world’s production of e-cigarette technology and products came from mainland China. Sales of e-cigarettes in the United States have risen rapidly since 2007.

(USDHHS, 2016, p.10)

CHARACTERISTICS OF E-CIGARETTES



Source: Penn State (2013)

Electronic cigarettes are a diverse group of products that produce a heated aerosol, typically containing nicotine, which users inhale via a mouthpiece. E-cigarettes range widely in design, appearance, and complexity, but generally contain similar components and operate in a similar manner. Common components of e-cigarettes include a battery, a heating coil, an atomizer that transforms the e-liquid to an aerosol, a cartridge that contains the e-liquid, and a mouthpiece (NASEM, 2018, p.55).

The basic operation of e-cigarettes generally follows several steps. First, the user draws upon the e-cigarette mouthpiece. Second, a user either manually presses a switch button to activate a heating element, or draws upon the e-cigarette and an airflow sensor automatically activates it. In automatically activated devices, the airflow sensor detects pressure changes and prompts the flow of power to a heating element and an LED (optional). The e-liquid contained in the device saturates a wick, which the heating element then aerosolizes. This process is commonly called “vaporization.” Aerosolized droplets of liquid subsequently flow into the user’s mouth and are inhaled into the lungs (NASEM, 2018, p.58).

TOBACCO OWNED COMPANIES

All the major tobacco companies and many smaller, independent companies are now in the e-cigarette business. When e-cigarettes first entered the U.S. market, they were sold primarily by independent companies via the Internet and in shopping malls at kiosks where those interested could sample the products (USDHHS, 2016, p.14).

Company	E-cigarette brand
Altria (NuMark)	MarkTen, Green Smoke, JUUL (33% in 2018)
Phillip Morris International	Heat-not-burn, IQOS brand (Vape Ranks 2014) E-cig, Nicolites by Nicocigs (Philip Morris International 2014), Blu
British American Tobacco	Vype, Vuse Vibe, Vuse Alto
R.J. Reynolds Tobacco Company (Reynolds Vapor Company)	VUSE
Lorillard Tobacco Company (Lorillard Vapor Company)	Blu (until 2015 when Phillip Morris purchased them)
Swisher	E-swisher
Japan Tobacco (JTI)	E-lites offered in United Kingdom by Zandera Ltd., which was acquired by Japan Tobacco Inc. In 2014. Ploom and PAX (used for vaporizing marijuana)

Source: USDHHS, 2016, p.15)



Source: British American Tobacco (2019)



Source: Phillip Morris International (2019)

TOBACCO OWNED COMPANIES

Local Tobacco Vaping Advertising



Source: Cody Orchard

CLASSIFICATIONS OF E-CIGARETTES

First Generation Devices

- E-cigarettes were often similar in size and shape to conventional cigarettes, with a design that also simulated a traditional cigarette in terms of the colors used. These devices were often called “cigalikes”. There were also other products designed to simulate a cigar or a pipe. Other “cigalikes” were slightly longer or narrower than a cigarette; they came in various colors ranging from white and tan to black and bright colors.



Source:123RF, [Piotr Marcinski]

These models used a cartridge design for the part of the device that holds the e-liquid, which is either prefilled with the liquid or empty and ready to be filled (USDHHS, 2016, p.11).



Source:123RF, [phadventure]

- Only three chemicals were listed in these devices (propylene glycol, nicotine, water).
- These devices contained only 5-20 mg/ml of nicotine.
- Designed to mimic the smoking experience as close as possible, these products served as stand-ins for cigarettes among users who wished to quit smoking or sought out an alternative product to a cigarette (NASEM, 2018, p.57).
- These devices are why we refer to vaping products as e-cigarettes. The newer devices do not look anything like a cigarette and are now referred to as vapors.

CLASSIFICATIONS OF E-CIGARETTES

Second Generation Devices



Source:123RF, [123plot]

- Second generation e-cigarettes are characterized by a clearomizer, a transparent cartridge that holds e-liquid and an atomizer, and a thin battery. Second generation devices include products that are shaped like pens, are comparatively larger and cylindrical, and are often referred to as “tank systems”, in reference to the transparent reservoir that holds larger amounts of e-liquid than previous cartridge-containing models (NASEM, 2018, p.57).
- This is the first time flavors and other chemicals are added to e-cigarette liquids.
- These devices are also popular with marijuana (THC) chemicals, because of the universal 510 thread battery. Consumers can purchase a prefilled tank with THC to replace one that is empty. Often called “Dank Vapes”.



Source:123RF, [Alexander Makarov]



Source:123RF, [shannoncapjah]

CLASSIFICATIONS OF E-CIGARETTES

Second Generation Devices Continued



Source: Cody Orchard

Item above is a “Dank Vape”. Dank Vapes typically have approximately of 98% THC in them. They can be bought in states that have legalized the sale of marijuana or sold illegally in the state of Idaho. This item was confiscated at a local high school in South Central Public Health District (SCPHD).



Source: Cody Orchard

These are examples of second generation vaping devices called “Vape Pens”. The two items on the left are 510 thread batteries. They are made to be universal. Any vaping tank or coil can attach to the top of them. Most marijuana shops sell the batteries and tops separately. That way you can just replace the liquid instead of the whole device. The middle device is the classic vape pen, but is not refillable. The item on the right is a vape pen that actually writes like a pen. It has a 510 thread battery that allows the user to switch out the liquid tank (attached to pen) and replace it with a tank that has a heating coil used for dabbing marijuana. You can see the *dabbing tool to the far right, which is used to place wax marijuana inside the device or can be used to clean it out. The device comes with a cover that you screw on over the e-liquid tank to make it look like a regular writing pen. These devices were confiscated at a local high school in SCPHD.

*For more information on dabbing go to page 37

CLASSIFICATIONS OF E-CIGARETTES

Third Generation Devices



Source:123RF, [Nicat Nasibli]

- Third generation devices represent a diverse set of products and constitute the greatest departure from the traditional cigarette shape. Many are square or rectangular and feature customizable and rebuildable atomizers and batteries.
- Users can modify the devices or build their own devices, which are often referred to as “MODS”, which is short for modifying.
- The differences in design and engineering of these products are key factors in the size, distribution, amount of aerosol particles, and the variability in levels of chemicals present in the e-liquid/aerosols delivered to the user.

(USDHHS, 2016, p.11)

These devices allow the user to change the wattage and create hotter coils. This makes the devices capable of creating large amounts of vape clouds, also known as
CLOUD CHASING.

CLASSIFICATIONS OF E-CIGARETTES

Third Generation Devices Continued



Source: Cody Orchard

All of the devices above were confiscated from local high schools in South Central Public Health District.

Rebuildable Drip Atomizers (RDA) are MOD devices used to build bigger clouds and get stronger flavors. Vapers use a toolkit like the one below to build coils that they attach to the RDA with negative and positive connections. They then put cotton inside the coils and soak them with e-liquid until the liquid turns to a vapor (see the picture below). This is extremely dangerous, because if the coils cannot withstand the battery power in the device it can cause them to explode or overheat. This method is also called Dripping.



Source: Cody Orchard

CLASSIFICATIONS OF E-CIGARETTES

Fourth Generation Devices

- Fourth generation devices are small and easy to hide. They are often called “PODS”.
- When “pods” first arrived on the market, the majority of them were closed system vape kits that were pre-filled with disposable cartridges that didn't allow a person to introduce different e-juice.
- Now there are open system pods with refillable cartridges, and devices that have refillable tanks built into their frames.
- These devices are often made to look like everyday common products found around the house, at the office, or in school. For example: hard drives, flash drives, watches, lipstick, drawstrings, coffee mugs, pens, and MP3 players.
- These devices are so popular that other companies have started copying the design created by JUUL.



Source:123RF, [Steven Heap]

CLASSIFICATIONS OF E-CIGARETTES

Fourth Generation Devices Continued



Source: Naftulin (2019)



Source: Cody Orchard



Source: Cody Orchard

Devices in bottom two photos were confiscated at local South Central Public Health District schools.

CLASSIFICATIONS OF E-CIGARETTES

Fifth Generation Devices

Fifth Generation devices started becoming popular in early 2020.

- Although similar in shape, size, and nicotine content to the fourth generation, disposable vaping devices do not have a removable pod and cannot be classified with fourth generation devices.
- Small, easy to hide, disposable vaping devices.
- Unlike disposable devices from the first generation that contained only 5-20 mg of nicotine, these devices can reach approximately of 30mg—60 mg of nicotine, making them more addictive, and harder to quit.
- They come in multiple flavors
- Due to being disposable, these vaping devices are able to get around federal regulations that required a flavor ban on all pre-filled fourth generation devices.
- Cost ranges from \$3.00—\$5.00 each



**WARNING: THIS PRODUCT CONTAINS NICOTINE.
NICOTINE IS AN ADDICTIVE CHEMICAL.**

Source: Puff Bar Disposable Device, (2020)



Source: Demand Vape (2020)

Historically, vaping devices adapt every three to four years. This allows them to create new ways of vaping, increase chemical ingredients, and get around government regulations. The following are dates listed are when they first entered the market and were replaced by a new generation: First Generation (2006-2009), Second Generation (2009-2012), Third Generation (2011-2017), Fourth Generation (2017-2020), Fifth Generation (2019–Present).

CLASSIFICATIONS OF E-CIGARETTES

Fifth Generation Devices Continued



Device Name	Zaero	Posh	Posh Plus	Puff Bar	Sea Stix	Eon Stik	Mr. Vapor	Stig	Mojo	Nano	Myle Mini	Twst	Blow Stix	Boss Vapes	Plus Pods	Ziip Z-Pod
E-Juice Capacity	1.8ml	1.8ml	2ml	1.3ml	1.2ml	1.3ml	1.3ml	1.2ml	1.2ml	1.5ml	1.2ml	1.0ml	1.2ml	1.2ml	1.2ml	1.4ml
Nicotine Strength	50 MG (5.0%)	60mg (6.0%)	60mg (6.0%)	20mg (2.0%), 50mg (5.0%)	50mg (5.0%)	68mg (6.8%)	50mg (5.0%)	50mg (5.0%)	50mg (5.0%)	49mg (4.9%)	50mg (5.0%)	50mg (5.0%)	60mg (6.0%)	50mg (5.0%)	60mg (6.0%)	60mg (6.0%)

Source: Vapor4Life (2020)



Source: Cody Orchard

Devices in bottom photo were confiscated at local South Central Public Health District schools.

CLASSIFICATIONS OF E-CIGARETTES

IQOS (I Quit Ordinary Smoking) Devices

- IQOS uses different technology than e-cigarettes.
 - Heat-not-burn [devices] are different from e-cigarettes because they use actual tobacco, not the flavored e-liquid typically found in e-cigarettes. The concept behind heat-not-burn [devices] is that it allows users to experience what looks and feels like smoking a regular cigarette without inhaling combusted tobacco.
- The devices have not been FDA approved.
 - The FDA stated, while its decision permits the tobacco products to be sold in the United States, it does not mean these products are safe or FDA approved.
- Heated tobacco products are not proven to be safer than cigarettes.
 - Research shows that although IQOS may have lower levels of some toxicants than cigarettes, they can still expose users to higher levels of other toxicants. Likewise, IQOS could result in users having lower risks of some diseases, but higher risks of others.

(Truth Initiative, 2019)



Source:123RF, [Daloiso Lorenzo]



Source:123RF, [vfhnb12]

The IQOS shops show similarity to Apple Stores. Slick Advertising is one of the many ways IQOS is advertising their product to appeal to a younger generation.

CLASSIFICATIONS OF E-CIGARETTES

IQOS (I Quit Ordinary Smoking) Devices



Source:123RF, [Oleksii Hulak]



Source:123RF, [maabaff]



Source:123RF, [Alexander Garlov]



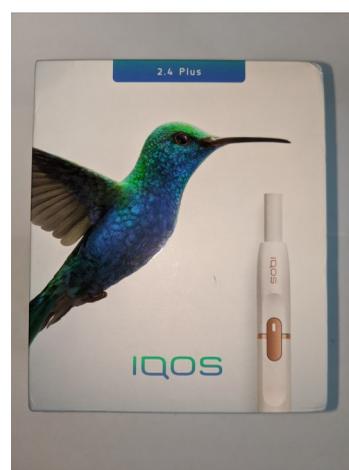
Source:123RF, [Alexander Garlov]



Source:123RF, [Alexander Garlov]



Source:123RF, [Abdul Razak Latif]



Source: Cody Orchard

POTENTIAL DANGERS

Dependence

“Nicotine is the principal pharmacological agent that causes dependence. Nicotine is delivered via the pulmonary route. The speed, efficacy, and magnitude of nicotine delivered produces a higher addiction” (NASEM, 2018, p.256). Becoming dependent on nicotine can lead to addiction, and will also lead to withdrawal symptoms if the addict tries to quit.

Withdrawal symptoms include:

- Stress
- Anxiety
- Anger
- Mood Swings
- Lack of concentration
- Grades dropping
- Lack of motivation

Coping skills:

- Exercise
- Play a game
- Watch a movie
- Write in a journal
- Hang out with non-smoking friends
- Create a project
- Finish a project
- Work on homework
- Listen to music



VAPING IS

STILL TOBACCO.

Text "Start My Quit"
to 855-891-9989 or call.

Free, confidential help. Just for teens.

WWW.MYLIFEMYQUIT.COM

MY LIFE MY QUIT™

Source: My Life My Quit (2020)

www.mylifemyquit.com was developed with youth who provided insight into how best to reach teens looking for support to stop using tobacco products, including electronic cigarettes like JUUL. My Life, My Quit coaches are specially trained to listen and understand teens, provide personalized support, and build relationships that support quitting tobacco (My Life My Quit, 2020).

POTENTIAL DANGERS

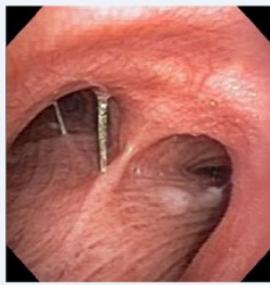
Cardiopulmonary Impact

The Airways of “Healthy” Vapers are Abnormal

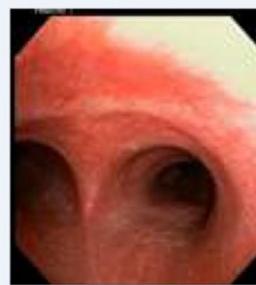
Non-smoker



Smoker



Vaper



New research has found that vaping alters the physical appearance of airways and lung macrophages.

Source: Ray Coakley (Ghosh et al. American Journal of Respiratory and Critical Care Medicine 2018)

Source: Ghosh et al. (2018)

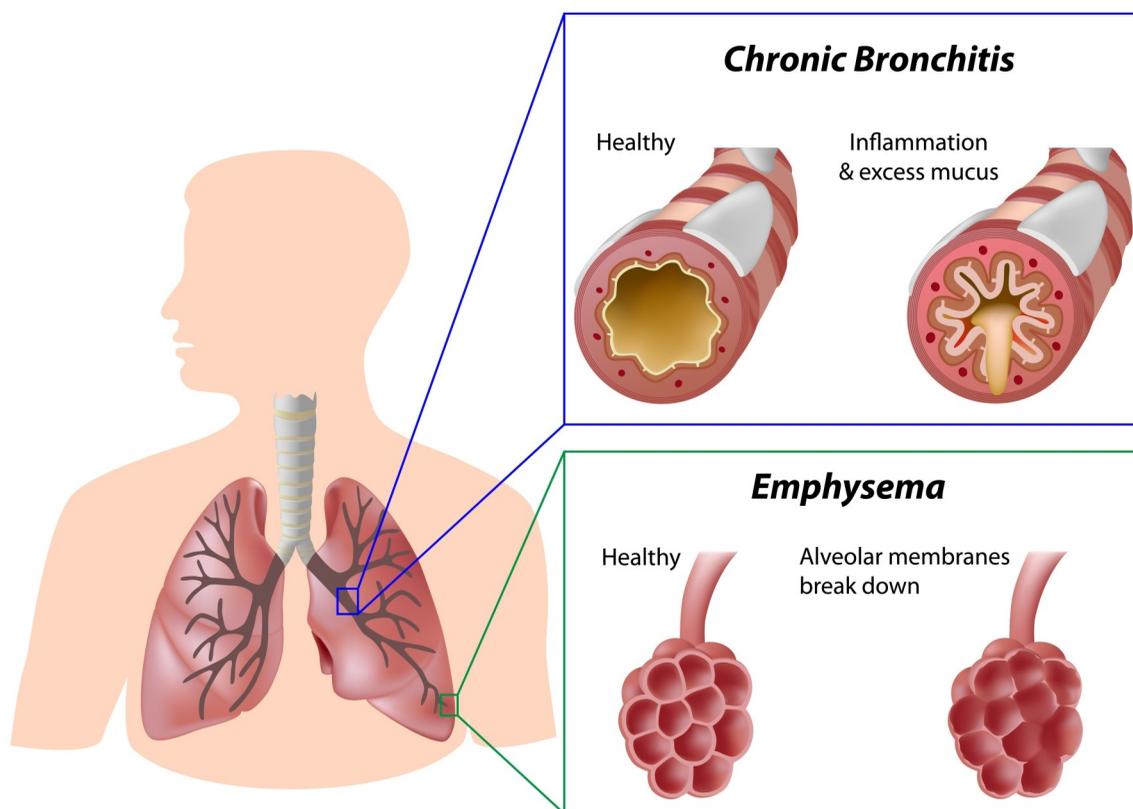
Notice in the picture above:

- The non-smoker airways are straight up and down, and you can see the macrophages are circular patterned. Macrophages destroy bacteria, viruses, and fungi. They are an essential part of the body's immune system.
- The smoker's airways are tilted and no longer straight up and down. They are narrowed, show signs of irritation, and contain phlegm. Notice the macrophages are now curved and no longer making a circular pattern.
- The vaping airways have extreme irritation, changes in the airways, and no signs of macrophages.

“We have concerns about the direct effects of e-cigarettes on the airways. This includes the potential for the use of such products to cause changes to airways that could be a precursor to cancer” (FDA Report On Seizures, 2019).

Cardiopulmonary Impact

Chronic Obstructive Pulmonary Disease (COPD)



Source:123RF, [alila]

Often promoted as a healthier alternative to smoking, current e-cigarette users were 1.3 times more likely to develop chronic lung diseases like emphysema, asthma and bronchitis. People who smoke conventional cigarettes increased their risk factor of developing chronic lung diseases by 2.6 times. For dual users—people who smoke and use e-cigarettes at the same time—these two risks multiply, more than tripling the risk of developing lung disease.

(Glantz, 2020)

POTENTIAL DANGERS

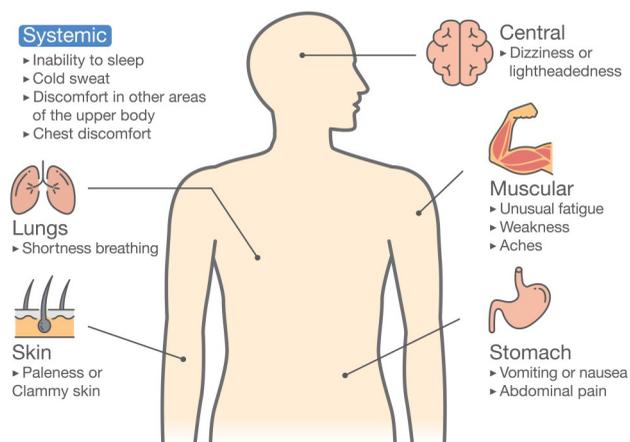
Cardiopulmonary Impact

Compared with non-users, e-cigarette users are:

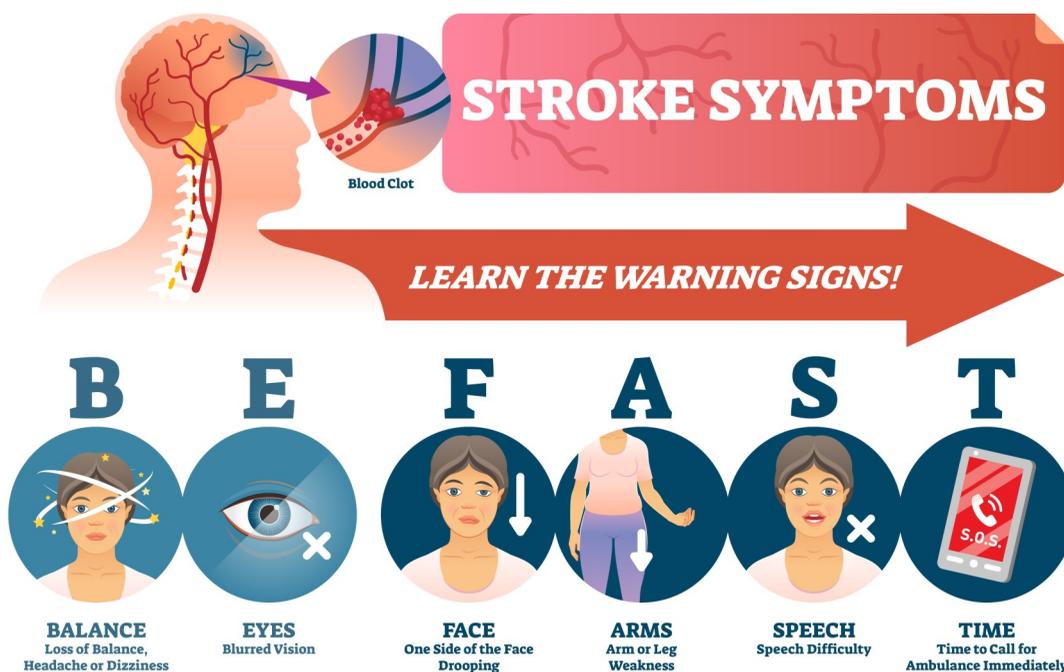
- 34 % more likely to have a heart attack.
- 25 % more likely to have coronary artery disease.
- 55 % more likely to suffer from depression or anxiety.
- 30 % more likely to suffer a stroke, high blood pressure, and circulatory problems.

(ACC, 2019)

Warning Signs of a Heart Attack



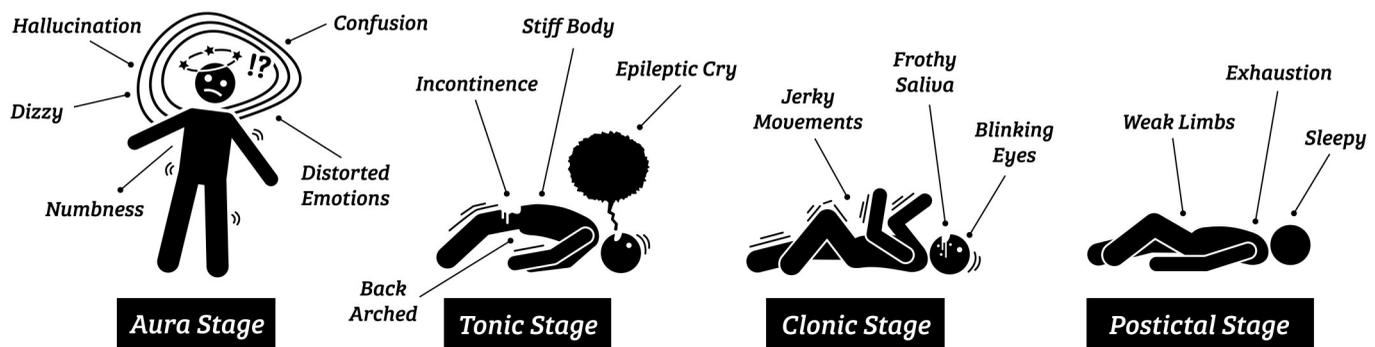
Source: 123RF, [Suriya Siritam]



Source: 123RF, [normaals]

Seizures

Stages of a Seizure



Source:123RF, [Khoon Lay Gan]

The FDA has seen a recent increase in voluntary reports that mentioned seizures occurring with e-cigarette use (e.g., vaping) signaling a potential emerging safety issue. E-cigarette users are experiencing seizures, with most reports involving youth or young adult users. Seizures or convulsions are known potential side effects of nicotine toxicity and have been reported in the scientific literature in relation to intentional or accidental swallowing of e-liquid (FDA Report On Seizures, 2019).

“If you think a person is having a seizure, call 911 and seek immediate medical help. For exposures with less serious visible effects, or if you have questions, call poison control at 800-222-1222”

(U.S. Food & Drug Administration, 2019)

POTENTIAL DANGERS

Vaping Leads to Smoking Traditional Cigarettes

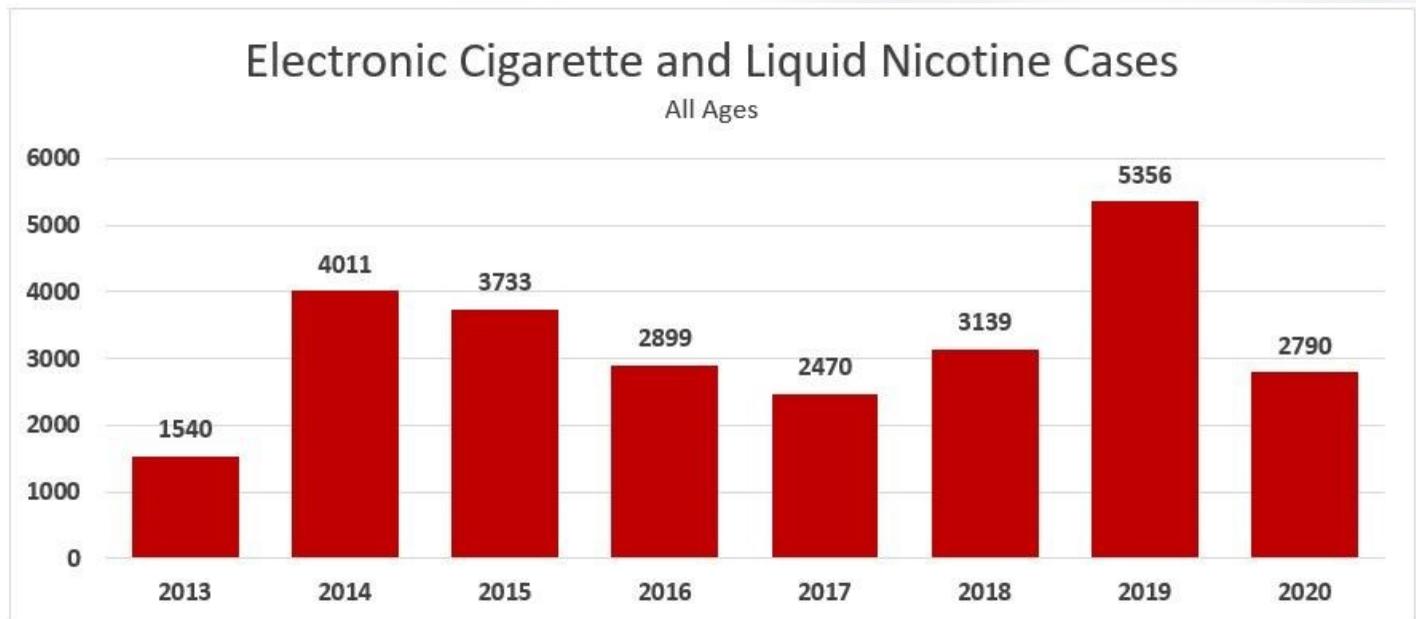


Source:123RF, [Diego Vito Cervo]

“When compared to adolescents who do not use e-cigarettes, adolescents who use e-cigarettes are 4x more likely to start smoking tobacco cigarettes within 18 months of starting e-cigarettes” (Primack, 2018).

“Teens have a 30 % chance of smoking a regular cigarette within 6 months of trying their first e-cigarette” (NIDA, 2016).

Poison Control



As of December 31, 2020

Source: AAPCC, 2021

Poison control centers began receiving calls about e-cigarettes and liquid nicotine products in 2011, which coincides with the initial period when these products reached the U.S. market. These products often contain a greater concentration of nicotine than other nicotine/tobacco products on the market. Some children and toddlers who come in contact with e-cigarette devices or liquid nicotine have become very ill: sometimes even requiring emergency department visits with nausea and vomiting being the most significant symptoms.

Exposures to vaping liquids and other products containing nicotine can cause nausea, vomiting, and dizziness. In serious cases, exposure can lead to life-threatening and severe symptoms like seizures, decreased heart rate, and decreased blood pressure. These symptoms can happen to anyone of any age, but the risk is greatest in children due to their size .

You can reach your local poison control center by calling the Poison Help hotline: 1-800-222-1222. To save the number in your mobile phone, text POISON to 797979.

(AAPCC, 2021)

POTENTIAL DANGERS

Outbreak of Lung Injury

As of June 2019, the Center for Disease Control and Prevention (CDC), the U.S. Food and Drug Administration (FDA), state and local health departments, and other clinical and public health partners are investigating a multi-state outbreak of lung injury associated with the use of e-cigarette, or vaping, products.

- All E-cigarette, or Vaping, product use Associated Lung Injury (EVALI) patients have reported a history of using e-cigarette, or vaping products.
 - THC is present in most of the samples tested by the FDA and most patients report a history of using THC-containing products.
 - The latest national and state findings suggest products containing THC, particularly those obtained off the street or from other informal sources (e.g. friends, family members, illicit dealers), are linked to most of the EVALI patients and play a major role in the outbreak.
 - A small percentage of findings report using only nicotine products.

Symptoms of Lung Injury Reported by Patients in This Outbreak

Patients in this investigation have reported symptoms such as:

- cough, shortness of breath, chest pain
- nausea, vomiting, abdominal pain, diarrhea
- fever, chills, weight loss

Some patients have reported that their symptoms developed over a few days, while others have reported that their symptoms developed over several weeks. A lung infection does not appear to be causing the symptoms.

Irrespective of the ongoing Investigation

- E-cigarette, or vaping, products should never be used by youths, young adults, or women who are pregnant.
- Adults who do not currently use tobacco products should not start using e-cigarette, or vaping, products.
- THC use has been associated with a wide range of health effects, particularly with prolonged heavy use. The best way to avoid potentially harmful effects is to not use THC, including through e-cigarette, or vaping, products. Persons with marijuana use disorder should seek evidence-based treatment by a health care provider.
- There is no safe tobacco product. All tobacco products, including e-cigarettes, carry a risk.

(CDC's Office on Smoking and Tobacco Use, 2019)

POTENTIAL DANGERS

Vitamin E Acetate

Laboratory data shows that vitamin E acetate, an additive in some THC-containing e-cigarette, or vaping, products, is strongly linked to the E-cigarette, or Vaping, product use Associated Lung Injury (EVALI) outbreak.

Key Facts about Vitamin E Acetate

- Vitamin E acetate is used as an additive, most notably in THC-containing e-cigarette, or vaping, products.
- Vitamin E is a vitamin found in many foods, including vegetable oils, cereals, meat, fruits, and vegetables. It is also available as a dietary supplement and in many cosmetic products, like skin creams.
- Vitamin E acetate usually does not cause harm when ingested as a vitamin supplement or applied to the skin. However, previous research suggests that when vitamin E acetate is inhaled, it may interfere with normal lung functioning.

(CDC's Office on Smoking and Tobacco Use, 2019)

- A recent study analyzed samples from 51 EVALI cases from 16 states and a comparison group of samples from 99 individuals without EVALI for vitamin E acetate, plant oils, medium chain triglyceride (MCT) oil, coconut oil, petroleum distillates, and diluent terpenes.
- Vitamin E acetate was identified in bronchoalveolar lavage (BAL) fluid samples (fluid samples collected from the lungs) from 48 of the 51 EVALI patients, but not in the BAL fluid from the healthy comparison group.
- No other toxicants were found in BAL fluid from either group, except for *coconut oil and limonene (1 EVALI patient each)

(Blount et al., 2020, p.697).



Source: 123RF, [Roxane Gonzalez Leyva]

*Vegetable glycerin is a known component of vaping liquids. Vegetable glycerin is made from soybean, coconut or palm oils. Please refer to page 28 for more information about Vegetable Glycerin.

POTENTIAL DANGERS

Bacterial Exposure Study

Harvard School of Public Health Researchers examined 75 popular e-cigarette products:

- 37 single-use cartridges
- 38 e-liquids from 10 top-selling U.S. brands
- The products were classified into four different flavor categories:
 - Tobacco, menthol, fruit, and other
 - Screened for the presence of endotoxin and glucan (toxic inflammatory substances that damage the lungs).

Researchers found:

- 2 % of the products contained traces of endotoxin, a potential inflammatory molecule found in bacteria.
- 81 % of the products contained traces of glucan, a toxic substance found in the cell walls of most fungi.

Exposure to these microbial toxins has been associated with a myriad of health problems, including asthma, reduced lung function, and inflammation.

(Lee Mi-Sun et al., 2019).



Source:123RF, [Borya Galperin]

POTENTIAL DANGERS

Respiratory Viruses (Influenza, Coronavirus, etc.)

The lungs have natural methods for cleaning air as it moves through the lungs. Cilia (hair like fibers) help clean the lungs, and macrophages (white blood cells) help fight infections and viruses. Even coughing helps protect the lungs.

According to a study done by researchers at Stanford University School of Medicine, young people who vape/smoke are at a higher risk of contracting respiratory viruses and if infected, will have a more difficult time fighting off the disease.



Source:123RF, [Kateryna Kon]

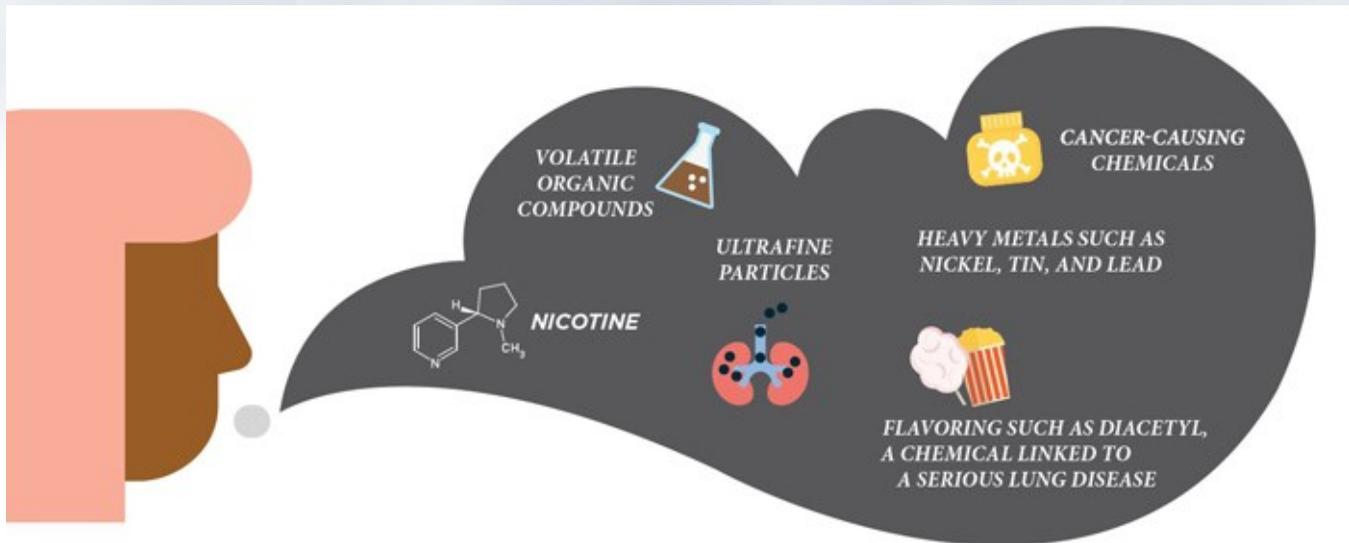
Researchers found that individuals who vaped were five to seven times more likely to be infected by the COVID-19 disease than those who did not use e-cigarettes. They were also five times more likely to exhibit symptoms.

According to the research, there could be several reasons vapers are at a higher risk for contracting the COVID-19 disease.

- E-cigarettes are harmful to the lungs and eventually alter the immune system, making each exposure to the virus more likely to trigger an infection.
- Second hand vaping particles emitted from e-cigarette users could have droplets with the virus on them.
- Sharing devices.
- Coronavirus spreads through repeated touching of one's hand to the mouth and face, which is common among cigarette and e-cigarette users.
- Smoking and vaping damage cilia and macrophages

(Gaiha et al., 2020)

SECOND HAND VAPING



Source: CDC's Office on Smoking and Health (2019)

The e-cigarette aerosol that users inhale 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, a chemical linked to a serious lung disease
- Volatile organic compounds (formaldehyde)
- Cancer-causing chemicals
- Heavy metals such as nickel, tin, and lead

It is difficult for consumers to know what e-cigarette products contain. For example, some e-cigarettes marketed as containing zero percent nicotine have been found to contain nicotine.



Source:123RF, [artofgalaxy]

(CDC's Office on Smoking and Tobacco Use, 2019)

Glycerol (a.k.a. Vegetable Glycerin)

Uses:

- Food additive
- Artificial sweetener
- Used to make hand lotions, toothpaste, hair care products, and shaving cream

Side Effects:

- Creates Acrolein (when heated) - has been known to cause lung damage and heart disease. Also used in weed killer.
- Allergies - made from coconut and palm oil.
- Can cause swelling in the throat, making it difficult to breathe.

Propylene Glycol

Uses:

- Ingredient in antifreeze.
- Has a sweet taste. That's why cats and dogs lick antifreeze on the ground and potentially die from it.
- Used to absorb certain medicines, cosmetics, or food products.

Side Effects:

- Toxic to liver and kidneys.
- Not safe for pregnant women and infants.
- If people and animals have repeated eye, skin, nasal, or oral exposure to propylene glycol for a short time, they may develop some irritation.

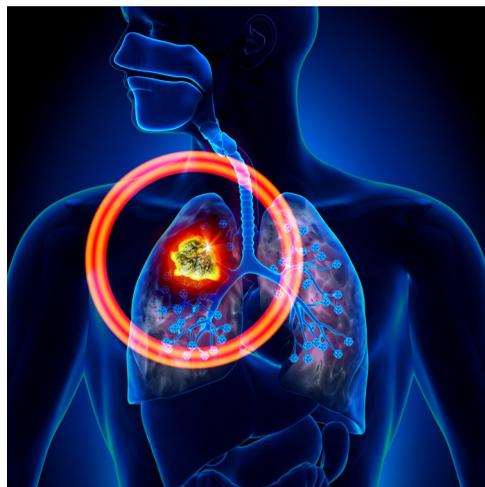
(ATSDR, 1997).

Formaldehyde (cancer causing)

Formaldehyde is a known degradation product of propylene glycol that reacts with glycerol during vaporization to produce hemiacetals.

Formaldehyde-releasing agents may deposit more efficiently in the respiratory tract than gaseous formaldehyde. As such, they could carry a higher slope factor for cancer.

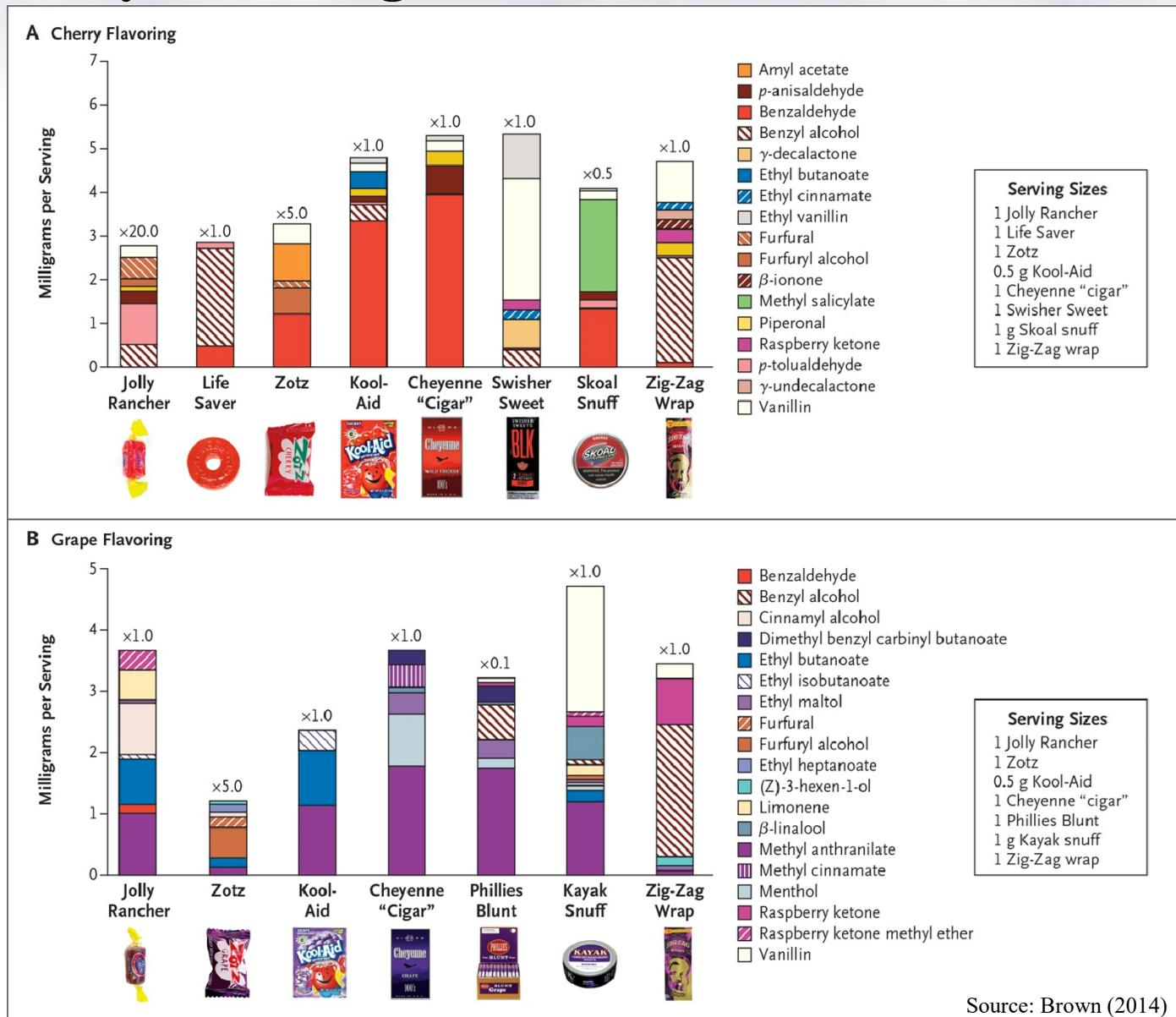
(Jensen, 2015, pp. 392-393)



Source:123RF, [decade3d]

CHEMICALS

Candy Flavorings in Tobacco



The picture above compares candy flavoring chemicals to tobacco flavoring chemicals. As you can see, there is overlap in flavor chemicals used. Some tobacco products contained flavor chemicals at much higher levels per serving than non-tobacco products. The same chemical-specific flavorings that are associated with fruit flavors in popular candy and drink products are being used in the engineering designs of flavored tobacco products (Brown, 2014, p. 2252).

The same flavoring chemicals in the above picture are found in vaping chemicals. Some have been known to cause cancer and respiratory problems.

Flavor Chemicals

The e-liquids in e-cigarettes are most often flavored; a study estimated that 15,000 unique flavors exist and that most of them are fruit or candy flavors. Flavors have been used for decades to attract youth to tobacco products and to mask the flavor and harshness of tobacco. Notably, 81.5 percent of current youth e-cigarette users said they used e-cigarettes because “they come in flavors I like”.



Source:123RF, [serpeblu]

There is concern that the availability of e-cigarettes with sweet flavors will facilitate nicotine addiction and simulated smoking behavior, which will lead to the use of conventional tobacco products. The safety of inhaling e-cigarette flavorings is in question. Some manufacturers have claimed their flavorants are generally recognized as safe for food additives (used in preparing foods to *eat*); little is known about the long-term health effects of *inhaling* these substances into the lungs.

(USDHHS, 2016, p.11).

Diacetyl (Popcorn Lung)

A recent study analyzed 159 e-liquids obtained from a variety of manufacturers and retailers in Europe and the United States for the presence of diacetyl. The study detected diacetyl in 39 of 51 flavors tested. Diacetyl provides a characteristic buttery flavor, is naturally found in various foods, and is used as a synthetic flavoring agent in food products such as butter, caramel, cocoa, coffee, dairy products, and alcoholic beverages. Although it is generally recognized as safe when *ingested* into the stomach, it has been associated with a decline in respiratory function in persons exposed to it through inhalation. Inhaling diacetyl aerosols can cause lung disease in those exposed. In addition, it has been implicated in the development of bronchiolitis obliterans, an irreversible respiratory disease also called *popcorn lung* disease.



Source:pixabay, [stevepb]

(USDHHS, 2016, p.116)

Nicotine

Nicotine is the primary psychoactive substance in conventional cigarettes. Responses to nicotine in adolescents differ from those seen in adults. The developing adolescent brain is immature and vulnerable, so it is important to understand how nicotine affects adolescent brain development. Substantial evidence suggests that nicotine can negatively influence both adolescent and prenatal brain development. Normal brain structure and functional development continues into young adulthood until age 25. Because of the immaturity and rapid growth of the prefrontal cortex, adolescents and young adults normally exhibit moody, risk-taking, and unpredictable impulsive behaviors. This makes them more likely to experiment with vaping and other drugs.

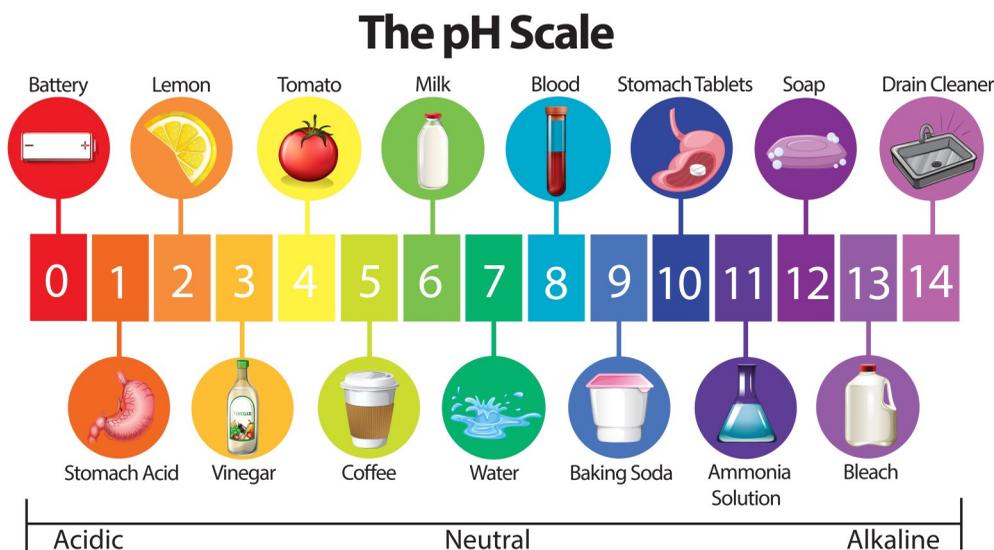
(USDHHS, 2016).

Freebase Nicotine

This is nicotine in its purest form. It is the same nicotine that is used in cigarettes, chewing tobacco and the first e-cigarettes. When inhaling freebase nicotine, it can cause a strong burning or gag reflex in the throat or lungs, most commonly called “Throat Burn”. The more nicotine inhaled per puff, the stronger the throat burn. This is why many smokers lose their voice throughout their lives.

Nicotine Salts (Nicotine Benzoate)

Freebase nicotine has a high pH level (8.5 - 11). This makes freebase nicotine taste bad and burn your throat. Some companies like JUUL, have been adding benzoic acid (pH level 4) to increase nicotine levels. If a company adds an acid to the chemical formula of nicotine, it lowers the pH level to give a smoother throat hit, which makes vaping 50mg bearable. The vaping devices seem safer than they are, due to e-liquid companies removing the throat burn effect.



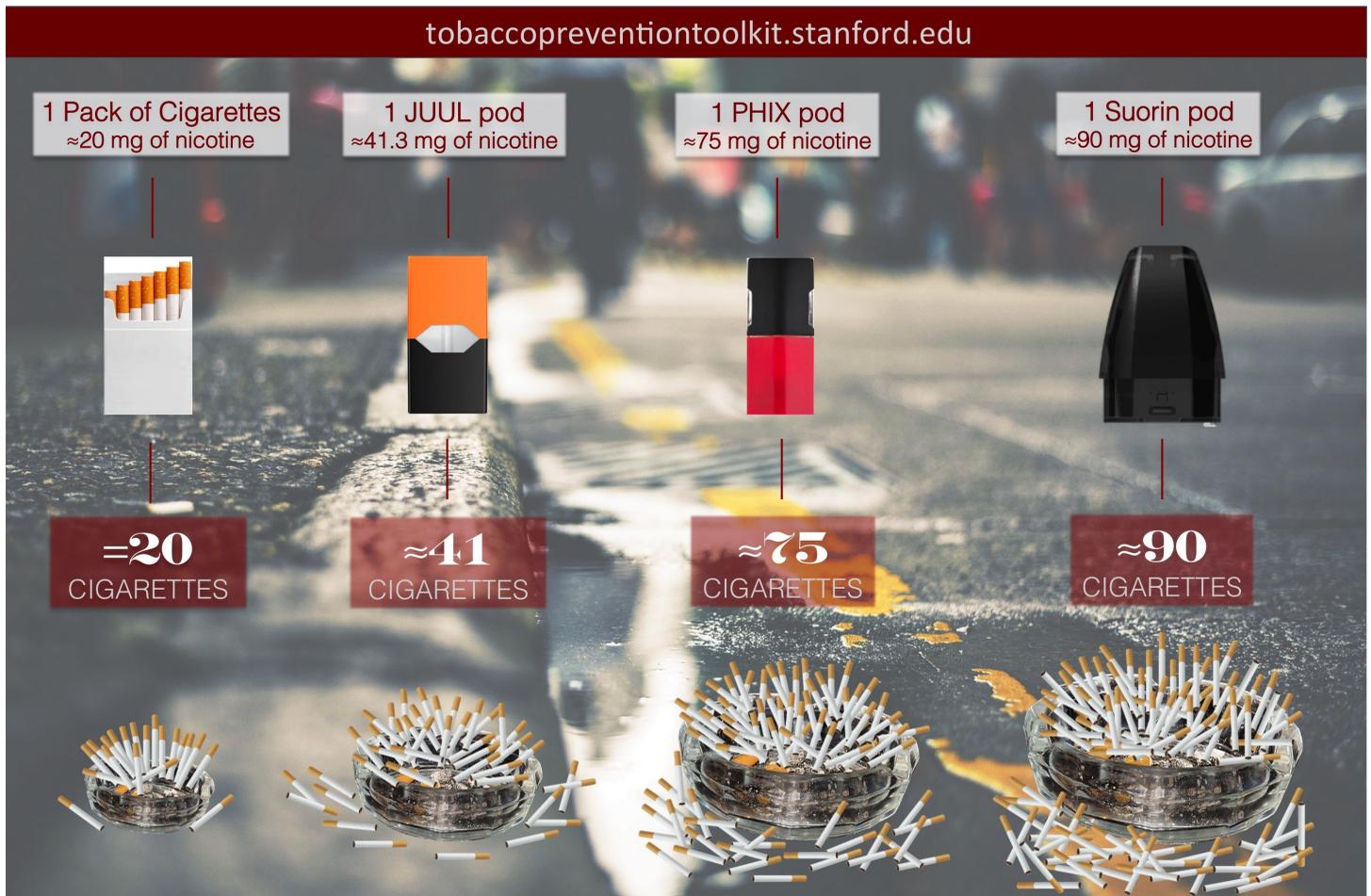
Source: 123RF, [blueringmedia]

Nicotine in Vaping Devices

Cigs in a Pod



tobaccopreventiontoolkit.stanford.edu



Nesbitt's Paradox

Nicotine is unique in comparison to most drugs, as its profile changes from stimulant to sedative/pain killer in increasing dosage. This phenomenon is described by Paul Nesbitt in his doctoral dissertation and also known as the Nesbitt's Paradox.

At low doses, nicotine potently enhances the actions of norepinephrine (alertness) and dopamine (pleasure) in the brain, causing a drug effect typical of psychostimulants (calming, relaxing).

At high doses, nicotine enhances the effect of serotonin and opiate activity, producing a calming, pain killing effect.

(Nesbitt, 1969)

CHEMICALS

Other Vaping Devices



Draw string vaping device

Source: Cody Orchard

- Can be used in a hoodie, or in a bookbag (similar to Camelback).
- Can only be used on draw activated devices. Meaning devices that turn on when the user starts sucking on it.

Vaping watch

- Device removes from watch band.

MP3 look alike

All of these devices have been found at local high schools in South Central Public Health District.

VAPING OTHER DRUGS

The Dark Side of Vaping

E-cigarettes have grown in popularity and claim to be a safer alternative to traditional cigarettes. However, for some, e-cigarettes have become an easy, almost undetectable way to abuse a wide range of synthetic drugs. People are vaping dangerous substances: alcohol, hash oil, caffeine, psychedelics, LSD, marijuana (THC), heroin, and opioids (fentanyl). They are doing this discreetly in vape pens, sometimes right in front of police, parents, and teachers. Some of these e-liquids are easily purchased online, making the user believe these products are a “safe high”. This couldn’t be further from the truth. Inhaling an unknown mix of unregulated synthetic chemicals is incredibly dangerous and can have a deadly effect (Education Specialty Publishing, LLC, 2016).



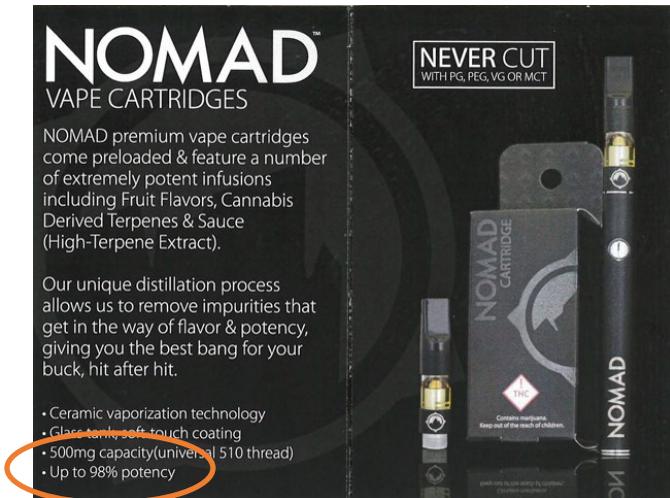
Source:123RF, [jeremynathan]



Source:123RF, [lightwise]

VAPING OTHER DRUGS

THC (Marijuana)



Source: Nomad Vapor, 2021



Source:123RF, [Arturs Budkevics]

THC (Tetrahydrocannabinol found in marijuana) vaping devices can have high percentages of potency. In the picture shown above, the NOMAD device is listed as having up to 98% potency. That means this device alone has up to 98% pure THC. Currently we do not have studies on the effects of 98% pure THC and what it can do to the brain. We do know that small amounts of THC can lead to “anxiety, paranoia, depression, schizophrenia, addiction, and has been linked to suicide among teenagers” (National Institute on Drug Abuse, 2019). Store purchased THC vaping devices are commonly known as Dank Vapes. They can be made at home with homemade liquids.

- The amount of THC in marijuana has been increasing steadily over the past few decades. For a person who’s new to marijuana use, this may mean exposure to higher THC levels with a greater chance of harmful reaction. Higher THC levels may explain the rise in emergency room visits involving marijuana use.
- Higher THC levels may also mean a greater risk for addiction if people are regularly exposing themselves to high doses.

(National Institute on Drug Abuse, 2019)

VAPING OTHER DRUGS

Dabbing (Marijuana Concentrates)

Dabbing is also a highly potent THC (Tetrahydrocannabinol) concentrated mass that is most similar in appearance to either honey or butter, which is why it is referred to or known on the street as “honey oil” or budder“ .

Marijuana concentrates contain extraordinarily high THC levels that could range upwards of 98%. This form of marijuana can be up to four times stronger in THC content than high grade or top-shelf marijuana, which normally measures around 20% THC levels.



Source:123RF, [Roxana Gonzalez Leyva]

The products resulting from these methods may be:

- a gooeey liquid wax (*hash oil or honey oil*)
- a soft solid with a texture like lip balm (*wax or budder*)
- a hard, amber-colored solid (*shatter*)

Hash oil and waxes can be consumed using vape pens. Solids can also be placed on a heated platform usually made of titanium, quartz, or ceramic, where they are vaporized by high heat and inhaled through a dabbing tool, often called a rig.

(National Institute on Drug Abuse, 2020).



Source:123RF, [Charles Wollertz]

Cannabinoid Hyperemesis Syndrome

Cannabinoid hyperemesis syndrome (CHS) affects heavy, chronic marijuana users.

Originally CHS was rarely seen among marijuana users, until vaping and dabbing became popular. With the use of high THC content in dabbing and vaping, we have seen a rise of CHS among marijuana users.

When a person inhales too much

THC, the receptors in their brain stop accepting THC and over stimulate the receptors associated to the central nervous system and the gastrointestinal tract. That is why most people experiencing this will vomit and find relief by taking hot showers or baths.




**Cannabinoid
Hyperemesis
Syndrome**

Source: Haynes (2019)



(Habboushe et al., 2018, p. 660)

Patients with CHS generally have a history of multiple emergency department visits and hospitalizations. Major features for the syndrome include:

- Severe cyclic nausea
- Vomiting
- Resolution of symptoms with cannabis cessation
- Symptom relief with hot showers or baths
- Abdominal pain (epigastric or periumbilical)
- Weight loss of greater than five kilograms

(Iacopetti & Packer, 2014, p. 65-67).

VAPING OTHER DRUGS

Methamphetamine

Behavioral Effects

- Includes alertness, energy and euphoria, restlessness, insomnia, hyperthermia, seizures, agitation, psychosis, paranoia, thirst, diaphoresis, paresthesia, headaches, aggression, angina, nausea and vomiting, hallucinations, palpitations, dyspnea, ventricular fibrillation, myocardial infarction, tooth decay (meth mouth), coma, and renal failure as well as rhabdomyolysis and suicidal ideation have been reported.

Usual routes of administration

- Inhalational, oral, intravenous, and intranasal.

Vaping Usage

- Literature indicates that an increasing number of individuals are using drug vaporization, such as e-cigarettes, as a new method of administration for methamphetamine. Additionally, researchers have recently shown that methamphetamine is present at reasonable concentrations in vapor from e-cigarettes.

(Breitbarth et al., 2018, p.103)

Vaping devices test positive for meth at high school

Maggie McGuire Moab Sun News Oct 10, 2019



COVID-19 Local News... →

Moab Sun News - COVID-19 Local News Fund

Give to support Moab Sun News as we cover the coronavirus crisis in our communities.

\$25	\$50
\$100	\$250
\$500	\$1,000
\$ Other	

Source: Moab Sun News, 2019

VAPING OTHER DRUGS

Cocaine

Behavioral Effects

- Includes myocardial infarction, cerebrovascular accident, ventricular tachycardia and ventricular fibrillation, seizures, paranoia, hyperthermia, bizarre and violent behavior, respiratory arrest, delirium, psychosis, anxiety, muscle rigidity, blurred vision and nausea. Inhalation of ‘crack’ cocaine has also been associated with more violent behavior and aggression when compared with the use of the hydrochloride salt of cocaine.

Usual Routes of Administration

- Intranasal, intravenous, and inhalational.

Vaping Usage

- Illicit drug forums suggest that cocaine in its free base form (crack cocaine) is being used in electronic cigarette style devices, with users stating that e-liquids containing cocaine are available for purchase on the dark web.

(Breitbarth et al., 2018, p.105)

The screenshot shows a news website interface. At the top, there is a navigation bar with the NBC 12 logo and various menu items like 'WATCH LIVE', 'NEWS', 'DECISION 2020', 'ON YOUR SIDE', 'NATIONAL', 'WEATHER', 'ABOUT US', and 'TV'. Below the navigation bar is a Fitbit advertisement for the 'SENSE & VERSA 3 INFINITY BAND (LUNAR WHITE) - LARGE' priced at \$29.95 with free shipping. The main content area features a 'CRIME' section with the headline 'Employees charged with selling cocaine, crystal meth out of vape shop'. Below the headline is a photograph of police lights on a car roof. To the right of the headline is a 'Learn more' button. At the bottom right, there is a weather forecast for Richmond, VA, showing a temperature of 58 degrees and a 'FULL FORECAST' button. The weather forecast is sponsored by Mechanicville Toyota.

Source: Smith (2020)

VAPING OTHER DRUGS

Heroin

Heroin is an opioid, working as a central nervous system depressant. Following administration of heroin, it crosses the blood-brain barrier and is rapidly converted into morphine along with other metabolites.

Behavioral Effects

- Includes agitation, hallucinations, paranoia, sinus tachycardia, seizures, lethargy hypotonia, apnea, leukoencephalopathy, pulmonary edema, coma, and sudden death have been reported following heroin use Pyrolysis products from vaporizing heroin at high temperatures have been shown to induce encephalopathy, inhalation of heroin has also been shown to cause acute eosinophilic pneumonia.

Usual Routes of Administration

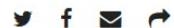
- Most commonly injected intravenously, but can also be inhaled or snorted intranasally.

Vaping Usage

- Illicit drug forums suggest that the freebase form of heroin is being used in personal electronic devices such as e-cigarettes. A convenience survey found that 7.1% of responding electronic vaping device users had vaped heroin. There is also evidence on illicit drug forums of other opioids, including oxycodone and morphine, being used in e-cigarettes.

Heroin in vape pens? Overdoses hospitalize 2 high school students, WV cops say

BY JARED GILMOUR
NOVEMBER 01, 2019 06:58 PM



Vapes and e-cigarettes have grown in popularity in recent years. Often advertised as a less dangerous alternative to cigarettes, medical professionals still have much to learn about their health effects.
BY JASON VORHEES | SAMANTHA MAX | JENNA EASON

Source: Gilmour (2019)

(Breitbart et al., 2018, p.106)

VAPING OTHER DRUGS

MDMA

MDMA, also known as ‘Ecstasy’ or ‘Molly’

Behavioral Effects

- Includes nausea, vomiting, restlessness, tremor, hyperreflexia, irritability, trismus and bruxism, palpitations, confusion, aggression, psychosis, panic attack, hyperthermia, serotonin syndrome, cardiac arrhythmias, hypertension, hyponatremia, seizures, coma, and death.

Usual Routes of Administration

- Oral, intranasal, inhalational, and via intravenous injection . MDMA blocks the reuptake of monoamine neurotransmitters (norepinephrine, serotonin, dopamine).

Vaping Usage

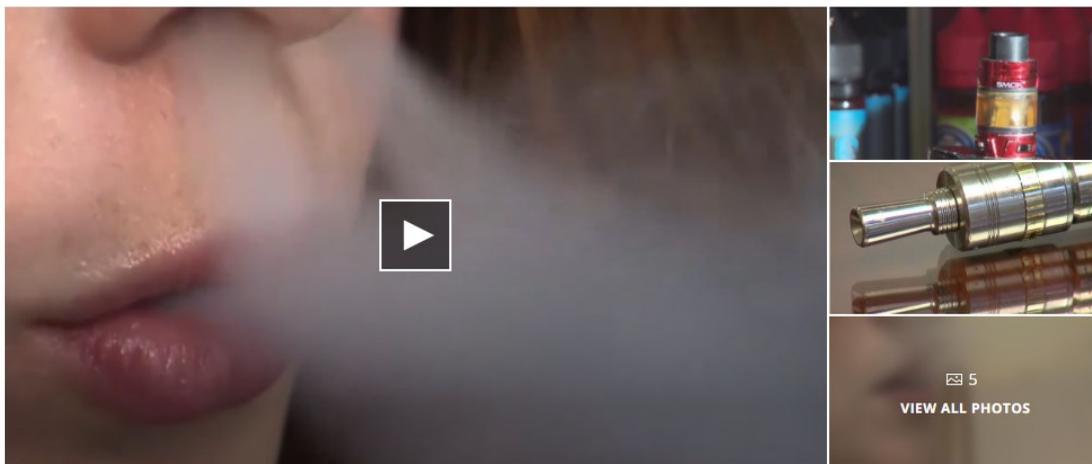
- There is evidence on internet drug forums of users employing vaporization techniques, such as e-cigarettes and table-top vaporizers, to vape MDMA. In several cases, users made mention of ensuring the drug was converted into the free-base form before vaporization. A recent survey determined that 11.7% of electronic vaping device users have vaped MDMA.

(Breitbarth et al., 2018, p.103-104)

DEA warns about nearly undetectable drugs in vape cartridges

by Jeremy Harris | Friday, July 12th 2019

AA



Drug agents in Utah say they are seeing an increase in the prevalence of illicit drugs being distributed in vape pen cartridges. (Photo: KUTV FILE)

Source: Harris (2019)

VAPING OTHER DRUGS

Fentanyl

Fentanyl is an opioid with 50–100 times the potency of morphine. Fentanyl is of particular importance given their role in the current opioid epidemic, with 19,413 deaths in the United States in 2016, more than double the number in 2015.

Behavioral Effects

- Similar to that of other opioids, including: analgesia, anxiolysis, euphoria, and drowsiness. constipation, nausea, pruritus, orthostatic hypotension, chest wall rigidity, confusion, hallucinations, weakness, and seizures are all possible toxic effects.
- In cases of overdose, signs include: extreme fatigue, obtundation (altered consciousness), cardiac arrest, bradypnea, severe confusion, and respiratory arrest.

Usual Routes of Administration

- Oral, enteral tubes, transdermal, transmucosal, and aerosol vaping usage

Vaping Usage

- A recent survey study found that 7.3% of electronic vaping device users had vaped fentanyl (2.5% of all survey respondents). In the literature, there is a case report of a 36-year old male presenting to the emergency department with altered mental status following vaping combined with oral consumption of ‘synthetic opium’, which upon further analysis was discovered to contain acetyl fentanyl. There is also a case of a 26-year old male found deceased with an e-cigarette near the body. Acetyl fentanyl was identified in both biological samples and the e-cigarette fluid.

Vape oil found to contain fentanyl, Mississippi authorities say

Therese Apel Mississippi Clarion Ledger

Published 1:36 p.m. CT Aug. 17, 2018 | Updated 2:08 p.m. CT Aug. 17, 2018



Source: Apel (2018)

(Breitbarth et al., 2018, p.106)

DEFINITIONS

A

Acrolein – Created by heating up glycerin. Has been known to cause heart problems and lung issues. Use in weed killer.

Advanced Personal Vaporizer (APV) – APVs usually have a larger battery, often with features such as variable voltage and wattage. An APV is more commonly called a MOD (modified e-cig).

Airflow (or Adjustable Airflow) – This often comes as an adjustable feature on tanks and atomizers which allows the user to control the draw resistance when using their vaping device.

B

BCC – Abbreviation standing for “bottom coil clearomizer”, where the coil of the atomizer sits at the bottom of the clearomizer tank.

BDC – Abbreviation for bottom dual coil clearomizer.

Box Mod – A box MOD is any PV or APV that comes in a box shape, and comes in several different wattage selections. Some popular wattage classes for box MODs are: 10-30 watts, 50-80 watts, 100+ watts.

BVC – Abbreviation for bottom vertical coils, a very popular design for atomizer coils.

C

Cartomizer (Carto) – This is a combination of disposable cartridges and atomizers. It holds more e-liquid than a regular cartridge/atomizer combination.

Clapton Coil – This coil is made with a large gauge wire wrapped tightly by a smaller gauge wire, like a guitar string, hence its name.

Clearomizer – A clearomizer is a transparent version of a cartomizer. Usually made of thin and easily breakable plastic, clearomizers hold roughly 2-3ml of e-liquid.

Coil – This is the wire that is used to vaporize the e-liquid by creating an electrical circuit. The coil is usually made up of Nichrome or Kanthal wire.

D

Dank Vape – Marijuana vaping devices that utilize 510 thread batteries and usually have high percentages of THC.

Deck – This is the flat base area, where the positive and negative posts sit on an RBA/RDA, which is designed to keep e-liquid off the battery connection.

Diacetyl – Diacetyl is a flavoring used in some e-liquid production for its buttery flavor (also used in some popcorn products). Diacetyl can cause bronchiolitis obliterans (otherwise known as Popcorn Lung) if inhaled in large concentration.

Draw – This is the name given to the inhale from the vaper’s mouth on the electronic cigarette mouthpiece (known as a drip tip, see below).

Dripping – This is the method of vaping which consists of adding a few drops of e-liquid directly into the atomizer chamber instead of using a cartridge. This is the method that gives the best vapor quantity and flavor quality.

Drip Tip – A mouthpiece accessory with an opening that allows drops of e-liquid to be dripped directly to the atomizer/cartomizer without the removal of the tip.

E

eGo/eGo Style – A style of electronic cigarette that utilizes the 510 threads and allows one to use 510 components, but with a much larger battery.

E-Juice – The solution that is vaporized within the atomizer tank, comprised of vegetable glycerin, propylene glycol, and/or nicotine and flavoring. Also referred to as e-liquid, juice, or smoke juice.

E-Liquid – Another popular name for e-juice.

E-NIC (Electronic Nicotine Inhaler) – another name for the electronic cigarette.

E-Smoke – Another Electronic Cigarette” (Dunworth, 2016).

Source for Definitions: (Dunworth, 2016)

DEFINITIONS

F

Flooding – This occurs when too much e-liquid is put into the atomizer. The indicator of flooding is a gurgling sound and the performance of the atomizer is sometimes negatively affected.

Formaldehyde – A known human carcinogen.

G

Genesis Atomizer – An RBA that uses stainless steel mesh as a wick, instead of the typical silica, and sits on the top of a tank (usually glass) with one or more holes in the deck leading into the tank.

Glassomizer – A clearomizer that uses glass rather than plastic for the tank.

Goose Neck – A flexible extension for your PV. Goose necks come in assorted colors and sizes.

Grub Screw – A type of screw used in atomizer posts. The tip is pointed to better secure wires.

H

Heat steeping – The process of speeding up steeping by placing one's e-liquid container in a hot water bath or in a hot environment for any length of time. This is usually used when making liquids at home.

High Resistance (HR) – An atomizer or cartomizer with a higher Ohm rating than the standard equipment. This allows you to apply higher voltage to the coil.

HV MOD – A dual battery or boosted supply MOD (modification) to allow higher power vaping.

I

Inception Coil – A nano coil inside a macro coil made from one continuous piece of wire.

Inhale – The act of breathing the vapor into your lungs (a.k.a draw).

J

Juice – Another name for e- liquid.

K

Kick/Kicked –

1. another way to describe throat hit.
2. A PV add-on installed between the battery and the spring to convert a standard Tube Mod PV into a variable wattage device.

Kanthal Wire – Trademark for a family of iron-chromium-aluminum (FeCrAl) alloys used in high temperature applications.

Kanthal, Kanthal A1 – Kanthal is a specific brand of resistance wire that is used in building coils for electronic cigarettes, usually sold for rebuildables. Kanthal A1 is a specific grade of Kanthal wire which is widely known to be the best wire for coil use.

L

Low Resistance (LR) – An atomizer or cartomizer with a lower ohm rating than the standard equipment. This generally causes the heating element to get hotter faster and produces vapor more quickly.

Lung Hit – Inhales of vapor straight to the lungs. Usually requires massive airflow.

M

Mechanical MOD (Mech MOD, Mech PV, Mech) – An electronic cigarette that doesn't have any electronics or wiring; it's just a metal tube with a mechanical switch that holds a battery and a connector for a topper of some sort.

Micro Coil – A type of wire coil wrap, where the loops of the coil are all touching, requiring more wraps than a traditional coil.

“Milligrams (mg) – The unit of measure for how much nicotine is in a cartridge. Typical levels include 0mg, 6mg, 8mg, 12mg, 16mg, 18mg, 24mg, 30mg, 36mg and 50mg”.

Source for Definitions: (Dunworth, 2016)

DEFINITIONS

Milliliters (mL) – The unit of liquid measurement

MOD – Short for modification. This originally referred to modifying a flashlight or a battery to be used in vaping, but is now commonly used to refer to any vaping device that is not a cigalike.

Mouth to lung hit – Vapor is pulled into the mouth first and then inhaled into the lungs. Can provide more flavor in the mouth.

N

Nic Juice – Nicotine liquid; also short for nicotine, the addictive substance in tobacco.

Nicotine (Nic) – The substance found within traditional and electronic cigarettes. It is available in various strengths. Some e-liquids have the option of no nicotine.

Nicotine Level – The amount of nicotine present in a cartridge or bottle of e-liquid. It is usually measured in mg per ml.

O

Ohm (Ω) – The standard unit of electrical resistance. A lower number indicates lower resistance and therefore faster heating.

Organic Cotton Coils – Features a larger heating section and the addition of Japanese organic cotton, which lasts longer than the majority of cheaper cotton coils. (2016).

P

Passthrough – A device that plugs directly into the USB port of a computer or charger and allows the user to vape without having to worry about battery life.

Pen Style – One of many styles of electronic cigarettes available, resembles a ball point pen.

Personal Vaporizer (PV) – Another name for an e-cigarette, usually in reference to the more untraditional style e-cigs.

Propylene Glycol (PG) – One of two main substances used in the making of e-cigarette liquids.

Priming/Prime – The act of preparing a wick to vape, usually done by soaking the wick in e-juice or taking a few pulls without heating the coil. This does not apply to drippers/drip-style atomizers.

R

Some very useful and popular abbreviations in the vaping world:

RBA – Rebuildable Atomizer

RDA – Rebuildable Dripping Atomizer

RDTA – Rebuildable Dripping Tank Atomizer

RTA – Rebuildable Tank Atomizer.

S

Squanking – Method of dripping that includes a squeezable bottle inside the MOD. Users squeeze the bottle and e-juice flows through a tube onto the hot atomizer.

Steeping – Allowing your e-liquid to sit either open to the air or in a sealed container. This is generally not necessary in e-liquid that has a high ratio of PG to VG. It is more often necessary in high VG ratio juices.

Stovetop Coil – Coils built to resemble the heating elements on electric stoves. Massive surface area is possible. Some claim they can produce insane amounts of vapor.

Sub-Ohming – The practice by experienced vapers of increasing the electrical current from a battery in order to reduce the ohms of the coils, achieving massive vaping clouds.

T

Tank – A special type of cartridge that holds considerably more liquid than cartridges with filler.

Source for Definitions: (Dunworth, 2016)

DEFINITIONS

Throat Hit – The feeling an e-cigarette smoker experiences when the vapor hits their throat. Most desire a full, yet smooth hit, not unlike traditional cigarettes.

Tiger Coil – A coil wrapped with a strand of regular Kanthal wire twisted with ribbon wire.

Topping Off – Adding a few drops of e-liquid into a cartridge, cartomizer or tank.

V

Vaper – The user of the electronic cigarette.

Vaper's Tongue – A common problem among many vapers when they vape too much of one flavor. Their taste buds become desensitized to the flavor.

Vapor – The atomization of e-liquid that results in a fog juice vapor. This is the main visible factor in vaping that simulates smoke.

Vaporizer – A vaporizer turns a liquid into a gas or a vapor. This is also another term used for electronic cigarette, e-cigarette or PV.

Vaping (vape) – The use of an electronic cigarette. Similar to the term smoking when referring to an cigarette.

Vertical Coil – Instead of leaving coils horizontal, they are rotated 90 degrees. This method often allow for better airflow in rebuildable dripping atomizers.

VG (Vegetable Glycerine) – A common ingredient found in e-liquid. Sweet tasting and of low toxicity, it is thicker than propylene glycol and is usually used where thicker liquid or vapor is desired or where a PG sensitivity is present.

Voltage – The amount of kinetic energy which (for our purposes), when paired with resistance, creates wattage.

VW (Variable Wattage) – Any PV, APV, or MOD that allows the user control over the wattage output across the atomizer coil.

W

Watt (wattage) – The amount of raw heat that the atomizer coil uses to vaporize e-liquid.

Wick – Used to deliver e-liquid to the coil in electronic cigarettes. Most atomizers use a wick that is most commonly made from silica cord. They can also be made from rolled up steel mesh, fiberglass, cotton, and sometimes ceramic materials.

Wicking – The process of osmosis where more concentrated fluid moves to an area of lesser concentration in an effort to find equilibrium.

Wrap – One revolution of a wire during the process of building coils. Wrap refers to the process of “wrapping” a wire around a tool, usually a drill bit or screwdriver.

510 – The most popular and common style of threading for electronic cigarettes. Originally developed by the company JoyE, it quickly became the standard within the industry.



Source:123RF, [artofgalaxy]

Source for Definitions: (Dunworth, 2016)

Bibliography

- AAPCC. “E-Cigarettes and Liquid Nicotine.” National Poison Data System, American Association of Poison Control Centers, 2021. <https://aapcc.org/track/ecigarettes-liquid-nicotine>.
- ACC. “E-Cigarettes Linked to Heart Attacks, Coronary Artery Disease and Depression: Data Reveal Toll of Vaping; Researchers Say Switching to e-Cigarettes Doesn’t Eliminate Health Risks.” ScienceDaily. American College of Cardiology, 2019. <https://www.sciencedaily.com/releases/2019/03/190307103111.htm>.
- ATSDR. “Agency for Toxic Substances & Disease Registry- Public Health Statement: Propylene Glycol,” 1997. <https://www.atsdr.cdc.gov/phs/phs.asp?id=1120&tid=240#bookmark07>.
- Blount, Benjamin C., Mateusz P. Karwowski, Peter G. Shields, Maria Morel-Espinosa, Liza Valentin-Blasini, Michael Gardner, Martha Braselton, et al. “Vitamin E Acetate in Bronchoalveolar-Lavage Fluid Associated with EVALI.” *New England Journal of Medicine* 382, no. 8 (February 20, 2020): 697. <https://www.nejm.org/doi/full/10.1056/NEJMoA1916433>
- Breitbarth, Andreas K., Jody Morgan, and Alison L. Jones. “E-Cigarettes—An Unintended Illicit Drug Delivery System.” *Drug and Alcohol Dependence* 192 (November 1, 2018): 98–111. <https://doi.org/10.1016/j.drugalcdep.2018.07.031>.
- Brown, Jessica E., Wentai Luo, Lorne M. Isabelle, and James F. Pankow. “Candy Flavorings in Tobacco.” *New England Journal of Medicine* 370, no. 23 (2014): 2250–52. <https://doi.org/10.1056/NEJMc1403015>.
- CDC’s Office on Smoking and Health. “About Electronic Cigarettes.” Centers for Disease Control and Prevention, 2019. https://www.cdc.gov/tobacco/basic_information/e-cigarettes/about-e-cigarettes.html.
- CDC’s Office on Smoking and tobacco use. “Outbreak of Lung Injury Associated with the Use of E-Cigarette, or Vaping, Products.” Centers for Disease Control and Prevention, November 15, 2019. https://www.cdc.gov/tobacco/basic_information/e-cigarettes/severe-lung-disease.html.
- CTFK. “Leading Health Groups Urge FDA to Stop Sales of New, Juul-Like E-Cigarettes Illegally Introduced Without Agency Review.” Campaign for Tobacco-Free Kids, 2018. https://www.tobaccofreekids.org/press-releases/2018_08_07_new_ecig_products.
- Dunworth, James. “The A - Z of Vaping: From Amps to Zero.” *Ashtray Blog* (blog), 2016. <https://www.ecigarettedirect.co.uk/ashtray-blog/2016/06/vaping-glossary.html>.
- Education Specialty Publishing, LLC. “Vaping Synthetic Drugs Pamphlet | E-Cigarettes & Vaping | PTR Press.” *Prevention and Treatment Resource Press* (blog), 2016. <https://www.ptrpress.com/product/vaping-synthetic-drugs-pamphlet/>.
- FDA Report on Seizures. “Statement from FDA Commissioner Scott Gottlieb, M.D., and Principal Deputy Commissioner Amy Abernethy, M.D., Ph.D., on FDA’s Ongoing Scientific Investigation of Potential Safety Issue Related to Seizures Reported Following e-Cigarette Use, Particularly in Youth and Young Adults.” FDA, 2019. <http://www.fda.gov/news-events/press-announcements/statement-fda-commissioner-scott-gottlieb-md-and-principal-deputy-commissioner-amy-abernethy-md-phd>.
- Gaiha, Shivani Mathur, Jing Cheng, and Bonnie Halpern-Felsher. “Association Between Youth Smoking, Electronic Cigarette Use, and COVID-19.” *Journal of Adolescent Health* 67, no. 4 (October 1, 2020): 519–23. <https://doi.org/10.1016/j.jadohealth.2020.07.002>.
- Glantz, Stanton A. “Heated Tobacco Products: The Example of IQOS.” *Tobacco Control* 27, no. Suppl 1 (November 2018): s1–6. <https://doi.org/10.1136/tobaccocontrol-2018-054601>.
- Glantz, Stanton PhD. “E-Cigarettes Significantly Raise Risk of Chronic Lung Disease.” Center for Tobacco Control Research and Education. Accessed August 28, 2020. <https://tobacco.ucsf.edu/e-cigarettes-significantly-raise-risk-chronic-lung-disease>.
- Gotts, Jeffrey E., Sven-Eric Jordt, Rob McConnell, and Robert Tarran. “What Are the Respiratory Effects of E-Cigarettes?” *BMJ* 366 (September 30, 2019): 1–15. <https://doi.org/10.1136/bmj.15275>.
- Habboushe, Joseph, Ada Rubin, Haoming Liu, and Robert S. Hoffman. “The Prevalence of Cannabinoid Hyperemesis Syndrome Among Regular Marijuana Smokers in an Urban Public Hospital.” *Basic & Clinical Pharmacology & Toxicology* 122, no. 6 (2018): 660–62. <https://doi.org/10.1111/bcpt.12962>.
- Iacopetti, Corina L., and Clifford D. Packer. “Cannabinoid Hyperemesis Syndrome: A Case Report and Review of Pathophysiology.” *Clinical Medicine & Research* 12, no. 1–2 (September 1, 2014): 65–67. <https://doi.org/10.3121/cm.2013.1179>.

REFERENCES

Bibliography Continued

- Idaho Public Health Districts. “Central District Health Department,” 2019. <https://www.cdhd.idaho.gov/contact-idahohealthdistricts.php>.
- Jensen, R. Paul, Wentai Luo, James F. Pankow, Robert M. Strongin, and David H. Peyton. “Hidden Formaldehyde in E-Cigarette Aerosols.” *New England Journal of Medicine* 372, no. 4 (2015): 392–94. <https://doi.org/10.1056/NEJMc1413069>.
- Lee Mi-Sun, Allen Joseph G., and Christiani David C. “Endotoxin and (1→3)-β-D-Glucan Contamination in Electronic Cigarette Products Sold in the United States.” *Environmental Health Perspectives* 127, no. 4 (April 2019): 047008. <https://doi.org/10.1289/EHP3469>.
- NASEM, Board on Population Health and Public Health Practice, Health and Medicine Division, and National Academies of Sciences, Engineering, and Medicine. *Public Health Consequences of E-Cigarettes*. Edited by Kathleen Stratton, Leslie Y. Kwan, and David L. Eaton. Washington, D.C.: National Academies Press, 2018. <https://doi.org/10.17226/24952>.
- “National Helpline | SAMHSA - Substance Abuse and Mental Health Services Administration.” Accessed July 23, 2020. <https://www.samhsa.gov/find-help/national-helpline>.
- National Institute on Drug Abuse. “Marijuana Concentrates DrugFacts.” National Institute on Drug Abuse, June 25, 2020. <https://www.drugabuse.gov/publications/drugfacts/marijuana-concentrates>.
- National Institute on Drug Abuse. “Marijuana DrugFacts.” National Institute on Drug Abuse, December 24, 2019. <https://www.drugabuse.gov/publications/drugfacts/marijuana>.
- Nesbitt, P. “Smoking, Physiological Arousal, and Emotional Response.” *Columbia University, New York*, 1969. <https://psycnet.apa.org/record/1973-26347-001>.
- Nesbitt, Paul D. “Smoking, Physiological Arousal, and Emotional Response.” *Journal of Personality and Social Psychology* 25, no. 1 (1973): 137–44. <https://doi.org/10.1037/h0034256>.
- NIDA. “Teens and E-Cigarettes.” National Institute on Drug Abuse, February 11, 2016. <https://www.drugabuse.gov/drug-topics/trends-statistics/infographics/teens-e-cigarettes>
- Perez, MF, N Atuegwu, C Oncken, and EM Mortensen. “E-Cigarettes Linked to Development of COPD.” *AJMC*, May 18, 2018. <https://www.ajmc.com/newsroom/ecigarettes-linked-to-development-of-copd>.
- Primack, Brian A., Ariel Shensa, Jaime E. Sidani, Beth L. Hoffman, Samir Soneji, James D. Sargent, Robert M. Hoffman, and Michael J. Fine. “Initiation of Traditional Cigarette Smoking after Electronic Cigarette Use Among Tobacco-Naïve US Young Adults.” *The American Journal of Medicine* 131, no. 4 (2018): 443.e1-443.e9. <https://doi.org/10.1016/j.amjmed.2017.11.005>.
- Massachusetts General Hospital. “Smoking, Vaping and COVID-19: About the Connection and How to Quit.” Accessed October 2, 2020. <https://www.massgeneral.org/children/vaping/smoking-vaping-and-covid-19>.
- Truth Initiative. “6 Important Things to Know about IQOS.” Truth Initiative, May 13, 2019. <https://truthinitiative.org/research-resources/emerging-tobacco-products/6-important-things-know-about-iqos-new-heated>.
- U.S. Food & Drug Administration. “Some E-Cigarette Users Are Having Seizures, Most Reports Involving Youth and Young Adults.” *FDA*, July 17, 2020. <https://www.fda.gov/tobacco-products/ctp-newsroom/some-e-cigarette-users-are-having-seizures-most-reports-involving-youth-and-young-adults>.
- USDHHS. “E-Cigarette Use Among Youth and Young Adults: A Report of the Surgeon General.” *U.S. Department of Health and Human Services*, 2016, 10–15.

Photos and Illustrations

- 123plot. "Electronic Cigarettes with an Autumn Background." 123RF, 2020. https://www.123rf.com/photo_106077246_electronic-cigarettes-with-an-autumn-background.html.
- Abdul Razak Latif. "KUALA LUMPUR, MALAYSIA - OCTOBER 08, 2019 : Heating Tobacco System.." 123RF, 2020. https://www.123rf.com/photo_134320169_kuala-lumpur-malaysia-october-08-2019-heating-tobacco-system-igqs-by-philip-morris-international-ele.html.
- Alexander Garlov. "Electronic Smoke Device Nobody." 123RF, 2020. https://www.123rf.com/photo_121168829_electronic-smoke-device-nobody.html.
- Alexander Garlov. "Electronic Smoke Device Wooden Clock Table Nobody." 123RF, 2020. https://www.123rf.com/photo_120715397_electronic-smoke-device-wooden-clock-table-nobody.html.
- Alexander Garlov. "Electronic Smoke Device Wooden Table." 123RF, 2020. https://www.123rf.com/photo_119833405_electronic-smoke-device-wooden-table.html.
- Alexander Makarov. "Man Smokes Electronic Cigarette on Dark Background." 123RF, 2020. https://www.123rf.com/photo_29951983_man-smokes-electronic-cigarette-on-dark-background.html.
- Alila. "Chronic Obstructive Pulmonary Disease." 123RF, 2020. https://www.123rf.com/photo_11387383_chronic-obstructive-pulmonary-disease.html.
- Apel, Therese. "Vape Oil Found to Contain Fentanyl, Mississippi Authorities Say." The Clarion-Ledger, August 17, 2018. <https://www.clarionledger.com/story/news/local/2018/08/17/mbn-some-vape-oil-confiscated-lasts-week-found-contain-fentanyl/1020766002/>.
- Artofgalaxy. "Electronic Cigarette on a Background of Burlap. E-Cigarette For.." 123RF, 2020. https://www.123rf.com/photo_92299601_electronic-cigarette-on-a-background-of-burlap-e-cigarette-for-vaping-popular-devices.html.
- Artofgalaxy. "Vaping Man Holding a Mod. A Cloud of Vapor. Dark Blue Background." 123RF, 2020. https://www.123rf.com/photo_92299507_vaping-man-holding-a-mod-a-cloud-of-vapor-dark-blue-background-.html.
- Arturs Budkevics. "Vape Pen and Medical Marijuana Hemp Bud. CBD and THC Oil Vaping.." 123RF, 2020. https://www.123rf.com/photo_132810758_vape-pen-and-medical-marijuana-hemp-bud-cbd-and-thc-oil-vaping-products-thc-formula.html.
- Blueringmedia. "An Education Poster of PH Scale Illustration." 123RF, 2020. https://www.123rf.com/photo_103211917_stock-vector-an-education-poster-of-ph-scale-illustration.html.
- Borya Galperin. "Filling of E-Cigarette Atomizer Tank with e-Liquid." 123RF, 2020. https://www.123rf.com/photo_54147460_filling-of-e-cigarette-atomizer-tank-with-e-liquid.html.
- British American Tobacco. "Alto Complete Kit," 2019. <https://vusevapor.com/alto-complete-kit>.
- Charles Wollertz. "Clear Bowl Filled with Gummy Bears and Marijuana Buds Around.." 123RF, 2020. https://www.123rf.com/photo_120069508_clear-bowl-filled-with-gummy-bears-and-marijuana-buds-around-isolated-on-a-white-background.html.
- Daloiso Lorenzo. "ROME JUNE 30,2020 IQOS Electronic Cigarette Boutique Entrance." 123RF, 2020. https://www.123rf.com/photo_151078324_rome-june-30-2020-iqos-electronic-cigarette-boutique-entrance.html.
- Decade3d. "Lung Cancer - Tumor Detail." 123RF, 2020. https://www.123rf.com/photo_29347944_lung-cancer-tumor-detail.html.
- DemandVape.com. "Hyde Color Edition 70 CT Display," July 24, 2020. <https://demandvape.com/hyde-color-edition-70-ct-display-1>.
- Diego Vito Cervo. "Youth Culture, Young People, Group of Male Friends, Mixed Race.." 123RF, 2020. https://www.123rf.com/photo_58547956_youth-culture-young-people-group-of-male-friends-mixed-race-teen-outdoor-teenager-in-park-hispanic-k.html.
- Gilbert, Herbert. "United States Patent and Trademark Office." Text. USPTO Office of Public Affairs (OPA), 1963. <https://www.uspto.gov/>.
- Gilmour, Jared. "Heroin in Vape Pens? Overdoses Hospitalize 2 High School Students, WV Cops Say." miamiherald, 2019. <https://www.miamiherald.com/news/nation-world/national/article236924363.html>.

REFERENCES

Photos and Illustrations Continued

- Ghosh, Arunava, Raymond C. Coakley, Teresa Mascenik, Temperance R. Rowell, Eric S. Davis, Keith Rogers, Megan J. Webster, et al. "Chronic E-Cigarette Exposure Alters the Human Bronchial Epithelial Proteome." *American Journal of Respiratory and Critical Care Medicine* 198, no. 1 (February 26, 2018): 67–76. <https://doi.org/10.1164/rccm.201710-2033OC>.
- Harris, Jeremy. "DEA Warns about Nearly Undetectable Drugs in Vape Cartridges." KUTV, July 12, 2019. <https://kutv.com/news/local/dea-warns-about-nearly-undetectable-drugs-in-vape-cartridges>
- Haynes, Margaret L. "Cannabinoid Hyperemesis Syndrome: Can 420 Doctor in Los Angeles Help You?" *OnlineMMJLosAngeles* (blog), February 8, 2019. <https://onlinemmjlosangeles.wordpress.com/2019/02/08/cannabinoid-hyperemesis-syndrome-can-420-doctor-in-los-angeles-help-you/>.
- Jeremynathan. "Marijuana and Cannabis Electronic-Cigarette." 123RF, 2020. https://www.123rf.com/photo_62120956_marijuana-and-cannabis-electronic-cigarette.html.
- Kateryna Kon. "MERS Virus, Meadle-East Respiratory Syndrome Coronavirus in Human.." 123RF, 2020. https://www.123rf.com/photo_98234531_stock-illustration-mers-virus-meadle-east-respiratory-syndrome-coronavirus-in-human-lungs-3d-illustration.html.
- Lightwise. "Vaping Death and Lung Disease Health Risk as a Person Exhaling.." 123RF, 2020. https://www.123rf.com/photo_131398164_vaping-death-and-lung-disease-health-risk-as-a-person-exhaling-steam-smoke-or-vapor-shaped-as-human-.html.
- Maabaff. "Varna, Bulgaria, July 2018. Two Workers Set an Advertising Poster.." 123RF, 2020. https://www.123rf.com/photo_116578615_varna-bulgaria-july-2018-two-workers-set-an-advertising-poster-for-electronic-cigarettes-iqos-on-a-b.html.
- Moab Sun News. "Vaping Devices Test Positive for Meth at High School," 2009. https://www.moabsunnews.com/news/article_497523d2-eb88-11e9-8180-8f5c0ab3a6e0.html.
- "My Life My Quit," 2020. <https://mylifemyquit.org/>
- Naftulin, Julia. "San Francisco's Most Popular e-Cigarette Brand Juul May Have Pushed Rival Brands to Compete in a 'nicotine Arms Race.' Now All e-Cigs Are Banned in the City." *Insider*, June 25, 2019. <https://www.insider.com/juul-high-nicotine-levels-salt-technology-ecigarettes-2019-2>.
- Nicat Nasibli. "Electronic Cigarette on a Background of Vape Shop. E-Cigarette.." 123RF, 2020. https://www.123rf.com/photo_132754389_electronic-cigarette-on-a-background-of-vape-shop-e-cigarette-for-vaping-popular-vape-devices.html.
- "Nomad Vapor," 2021. <http://nomadvapor.com/>.
- Normaals. "Stroke Symptoms Vector Illustration. Warnings of Sudden Blood.." 123RF, 2020. https://www.123rf.com/photo_112544514_stock-vector-stroke-symptoms-vector-illustration-warnings-of-sudden-blood-clot-in-head-labeled-list-with-reasons-.html.
- Oleksii Hulak. "October 19.2019, Kiev, Ukraine : IQOS Electronic Cigarette Of.." 123RF, 2020. https://www.123rf.com/photo_142591756_october-19-2019-kiev-ukraine-iqos-electronic-cigarette-of-a-new-generation-from-the-company-philip-m.html.
- Penn State. "E-Cigarettes: The Future of Safe Smoking? | SiOWfa13: Science in Our World," 2013. <https://sites.psu.edu/siowfa13/2013/10/25/e-cigarettes-the-future-of-safe-smoking/>
- Phadventure. "Electronic Cigarette." 123RF, 2020. https://www.123rf.com/photo_20597054_electronic-cigarette.html.
- Phillip Morris International. "Myblu™ Vape & E-Juice Liquidpods | Deals & Specs | Blu." blu US, 2019. <https://www.blu.com/en/US>.
- Piotr Marcinski. "Young Woman Holding in One Hand Classic Cigarette and in Other.." 123RF, 2020. https://www.123rf.com/photo_16772390_young-woman-holding-in-one-hand-classic-cigarette-and-in-other-electronic-cigarette.html.
- Puff E-Cig. "Puff Bar Disposable Device," July 24, 2020. <https://puffecig.com/puff-bar-disposable-device/>.

Photos and Illustrations Continued

- Roxane Gonzalez Leyva. "Assorted Medical Cannabis Products with Leaf, Capsules and CBD.." 123RF, 2020. https://www.123rf.com/photo_117903604_assorted-medical-cannabis-products-with-leaf-capsules-and-cbd-oil-isolated-over-white-background.html.
- Macro Detail of Dab Tool with Cannabis Concentrate Aka Shatter.." 123RF, 2020. https://www.123rf.com/photo_117903527_macro-detail-of-dab-tool-with-cannabis-concentrate-aka-shatter-isolated-over-white-background-medica.html.
- Serpeblu. "Elegant Pregnant Woman Smoking E-Cigarette in Office at Work." 123RF, 2020. https://www.123rf.com/photo_43358046_elegant-pregnant-woman-smoking-e-cigarette-in-office-at-work.html.
- Shannoncapjah. "Two Vape Pen THC/CBD Oil Vape Pen Cartridges & Cannabis Leaf." 123RF, 2020. https://www.123rf.com/photo_132074375_two-vape-pen-thc-cbd-oil-vape-pen-cartridges-cannabis-leaf.html.
- Smith, Hannah. "Employees Charged with Selling Cocaine, Crystal Meth out of Vape Shop." <https://www.nbc12.com>, September 30, 2020. <https://www.nbc12.com/2020/09/30/employees-charged-with-selling-cocaine-crystal-meth-out-vape-shop/>.
- Steven Heap. "MORGANTOWN, WV - 26 AUGUST 2018: Juul e-Cigarette or Nicotine.." 123RF, 2020. https://www.123rf.com/photo_117822247_morgantown-wv-26-august-2018-juul-e-cigarette-or-nicotine-vapor-stick-and-juulpods-in-pencil-case.html.
- Stevepb. "Imagen Gratis En Pixabay - Palomitas De Maíz, Merienda, Salado," 2020. <https://pixabay.com/es/photos/palomitas-de-ma%C3%ADz-merienda-salado-731053/>.
- Suriya Siritam. "Diagram about Warning Signs of a Heart Attack. Illustration About.." 123RF, 2020. https://www.123rf.com/photo_96085729_stock-vector-diagram-about-warning-signs-of-a-heart-attack-illustration-about-medical-diagram-for-diagnose-a-dise.html.
- Tobacco Prevention Toolkit. "Tobacco Prevention Toolkit," 2019. <https://med.stanford.edu/tobaccopreventiontoolkit.html>.
- Tumsasedgars. "Vaping, Health Risks and Causes of Death Concept. Keywords And.." 123RF, 2020. https://www.123rf.com/photo_132839289_vaping-health-risks-and-causes-of-death-concept-keywords-and-icons-on-white-background.html.
- Vfhn12. "Kiev, Ukraine - January 17, 2019: New Design IQOS. Showcase With.." 123RF, 2020. https://www.123rf.com/photo_137705062_kiev-ukraine-january-17-2019-new-design-iqos-showcase-with-a-large-multi-colored-selection-.html.
- Vapor4Life. "Best Disposable Vape Alternatives." *Vapor4Life* (blog), February 25, 2020. <https://www.vapor4life.com/blog/best-disposable-vape-alternatives/>.

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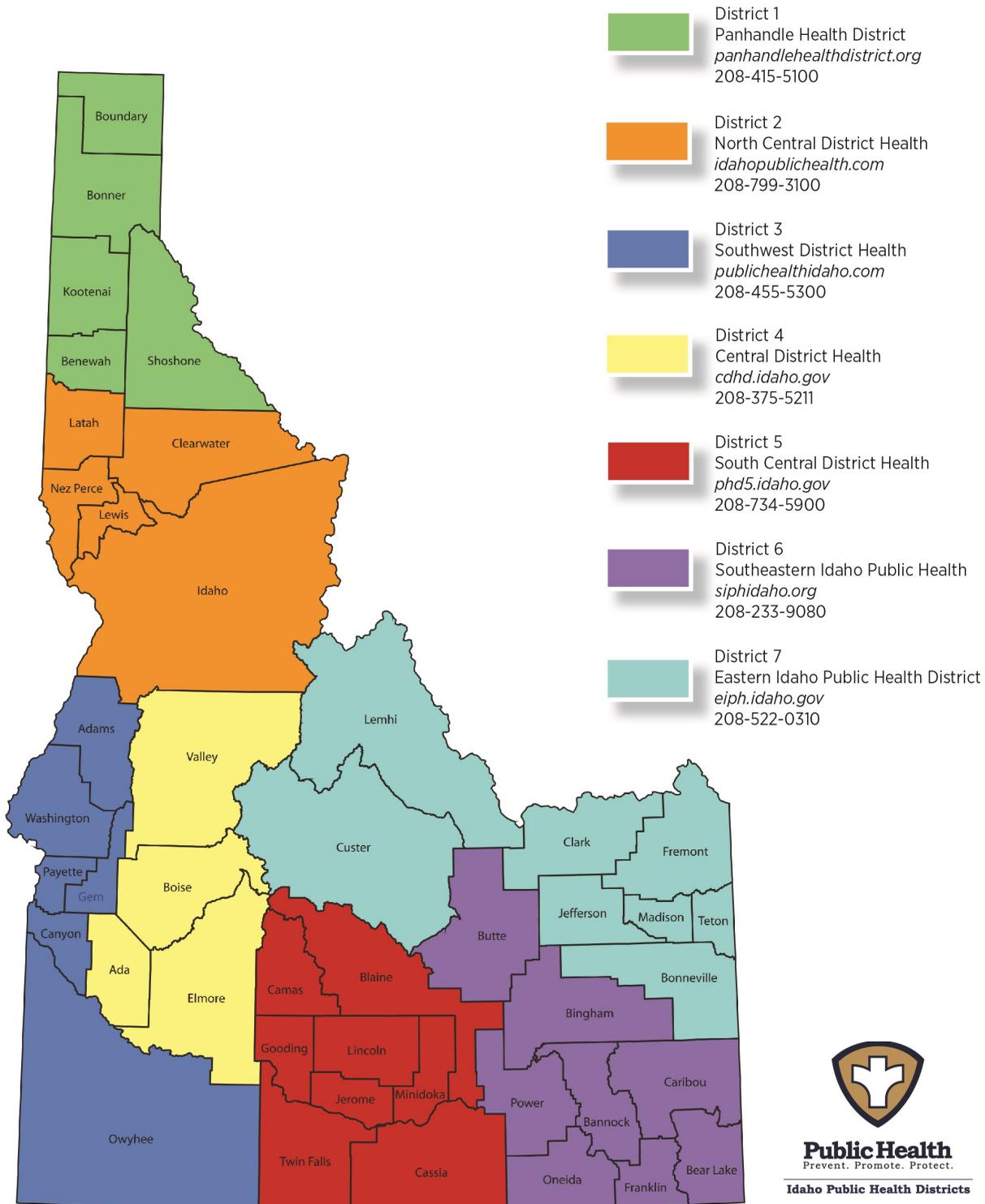
Board Secretary, SPHD Director

Idaho Office Of Drug Policy

Youth E-cigarette/Vaping Education Mini Grant

If you are struggling with an addiction to nicotine, local Idaho health districts offer free quit assistance for adults, prenatal women, and teens.

Idaho Public Health Districts



Public Health
Prevent. Promote. Protect.

Idaho Public Health Districts

(Idaho Public Health Districts, 2019)