

# Clearing the Air

## The Truth About Vaping

# TABLE OF CONTENTS

- 2** Electronic Smoking Devices 101
- 4** Health Effects
- 6** ESD Use Statistics
- 7** Juul Explained
- 9** Cessation Resources
- 10** TFQC Coalition
- 11** Notes & References

# ELECTRONIC SMOKING DEVICES 101

Electronic smoking devices (ESDs) go by many names - e-cigarettes, electronic nicotine delivery systems (ENDS), vapes, vape pen, tank systems and mods. ESDs are often called by their brand name as well - Juul, NJOY, and Suroin. The ESD structure and design has evolved over the years to become more compact, discreet, and fashionable. They come in a variety of different sizes and shapes. Some even look like common household items such as pens, USB flash drives, or even smartwatches. Below are some examples of modern ESDs.



Images courtesy of Suroin, Juul, NJOY, and other ESD companies found through Google Image Search on September 16, 2019

ESDs are non-combustible products that do not produce smoke. The battery-operated devices use a heating element to heat a liquid solution from a cartridge. The liquid then becomes an aerosol that can be inhaled. Each ESD has these four parts -

1. Liquid cartridge (a.k.a. pods, mods, e-liquid)
2. Heating element (a.k.a. atomizer)
3. Power source (typically a rechargeable battery)
4. Mouthpiece

There are apparel and accessories that users may choose to purchase as well. Companies, such as Vaprowear, design hoodies and book bags that attach to the mouthpiece of an ESD while storing the device in a discreet pocket. Once there is an air-tight seal around the mouthpiece, the aerosol travels through specially designed and lined tubes. These tubes may appear similar to the strings of a sweatshirt's hood or a book bag hydration pack.

Liquid cartridges, often referred to as e-juice, can come in thousands of different flavors. Flavors can range from more traditional tobacco and menthol to cotton candy, mocha java, blue raspberry lemonade, and countless others. These liquids are popularly used with nicotine solutions. When e-cigarettes were first on the market, solutions averaged 1%-2.4% nicotine concentration. (4) Now, it is not uncommon to find 5% concentration in-store and online for purchase.

Nicotine isn't the only controlled substance sold for use in ESDs. Two other popular liquids to vape are THC, the psychoactive ingredient found in marijuana, and meth, a synthetic stimulant. The Quad Cities has been experiencing an increase in meth use via ESDs. (15)

Whatever the controlled substance, e-liquids include many other chemicals. **Propylene glycol** and **vegetable glycerin**, known toxic chemicals, are two primary ingredients in e-cigarettes. (8, 18) **Acrolein**, an herbicide linked to lung injury and COPD, is also found in some cartridges. These types of chemicals are also present in the secondhand emission. (18) The Surgeon General stated in 2016 that "nicotine; ultrafine particles; flavorings such as **diacetyl**, a chemical linked to serious lung disease; volatile organic compounds such as **benzene**, which is found in car exhaust; and heavy metals, such as **nickel, tin, and lead**" were detected in "the cloud". (18)



Image courtesy of American Lung Association

A popular ESD marketing claim is that electronic cigarettes help current smokers quit using combustible cigarettes. According to the American Lung Association and Food and Drug Administration, **no** e-cigarettes have been found to be safe and effective in aiding cessation. (18)

For more information about evidence-based methods and FDA-approved treatments, please turn to [Cessation Resources](#) on page 9.

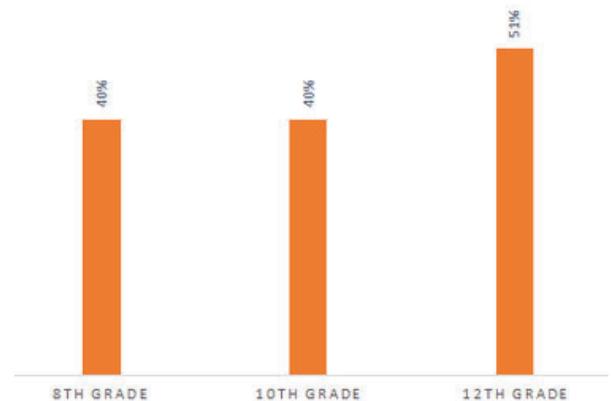
On July 1, 2019, Illinois became the 17th state in the United States of America to stop sales of tobacco and nicotine products to individuals under the age of 21. (9) This legislation has been nicknamed **Tobacco 21**. This act prohibits the sale and distribution of electronic cigarettes to any person under the age of 21. Online sales must require age verification through a third-party. It also limits the self-service display and vending sales of e-cigarettes to adult-only facilities. (9)

Iowa has similar limitations on sales but at a lower age. Individuals who are 18 or above may purchase ESDs. (10) For more information about e-cigarette regulations across the U.S.A., please visit the Public Health Law Center's 50 State Review.

# HEALTH EFFECTS

Many ESD companies market their devices as safer alternatives to combustible cigarettes. Instead of tar and actual tobacco leaves, there is an aerosol. This aerosol is a harmless water vapor. Right?

A large percentage of Rock Island County students believe using e-cigarettes and/or other vaping devices pose "no risk" or "slight risk" to harming their bodies. (17)



Graph courtesy of TFQC  
Source: Illinois Youth Survey, Rock Island County Report, 2018

It is not just harmless water vapor. Youth often do not realize they are harming their lungs and brains by using e-cigarettes. These chemicals can cause asthma, COPD, lung cancer, and cardiovascular disease. The American Lung Association published the following comments.

"Using e-cigarettes causes health risks. (The 2018 NAM report) concluded that e-cigarettes both contain and emit a number of potentially toxic substances. (It) also states there is moderate evidence that youth who use e-cigarettes are at increased risk for cough and wheezing and an increase in asthma exacerbations." (18)

Harvard School of Public Health found many electronic smoking devices contain **diacetyl**, the chemical linked to "popcorn lung". (14, 28) The condition **obliterative bronchiolitis** was nicknamed "popcorn lung" after workers at a microwave popcorn factory showed symptoms at an above average rate. The flavoring ingredient, diacetyl, though approved for consumption, is dangerous when inhaled. (28)

Secondhand emissions, a.k.a. vape clouds, also contain hazardous chemicals. These aerosolized chemicals can then harm others in the vicinity of the user. Please visit page 3 of [Electronic Smoking Devices 101](#) for more detailed information.

In April of 2019, the Food and Drug Administration began investigating 127 cases connecting seizures with vaping. (21)

As of November 5, 2019, the CDC and FDA are still investigating cases of EVALI (**E**-cigarette or **V**aping product use **A**ssociated **L**ung **I**njury) across the US. There have been 2,051 confirmed cases of EVALI and 39 associated deaths. (26)

Most youth do not know that the majority of electronic smoking devices contain nicotine. (11)

In general, the more nicotine a person uses, the more likely they will become dependent and addicted to nicotine. Nicotine interacts with the prefrontal cortex of the human brain where emotions and impulses are controlled. (13) Neurotransmitters, such as dopamine and acetylcholine, are also affected by nicotine use. (13)

A human brain doesn't stop developing until around the age of 25. (32) Brain development is critical during the teen years and nicotine use alters the reward pathway. (13) Because of this, adolescents progress faster to nicotine dependence and addiction than adults. These brain alterations can also lead to additional substance misuse. (13)

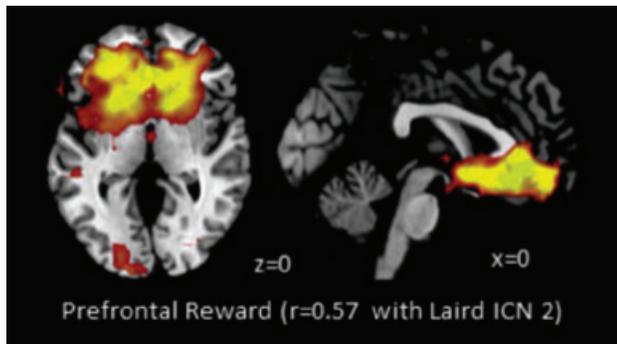


Image courtesy of Dr. Andrea L. Hobkirk

**"Two of out three youth using JUUL didn't realize (they were using nicotine)."**

S. Christy Sadreameli, MD, MHS  
Pediatric Pulmonologist, Johns Hopkins Hospital

A study sponsored by the National Institute on Drug Abuse researched how the brain reacts to e-cigarette nicotine use, specifically withdrawal from the nicotine. They reported that e-cigarettes have similar effects on the brain as combustible cigarettes. (30)

Health effects of combustible cigarette use are more widely known. Common tobacco-related diseases are lung cancer, emphysema, and heart disease. An estimated 480,000 Americans die each year due to a tobacco-related disease. (31) According to the Centers for Disease Control and Prevention, "Tobacco use is the leading cause of preventable disease and death in the United States; nearly all tobacco product use begins during youth and young adulthood." (31)

Yes, the exact long-term health effects caused by using electronic smoking devices are still being researched. However, there have been numerous correlations with major respiratory illnesses, and even death, to give warning.

**"I, Surgeon General of the United States Public Health Service, VADM Jerome Adams, am emphasizing the importance of protecting our children from a lifetime of nicotine addiction and associated health risks by immediately addressing the epidemic of youth e-cigarette use.**

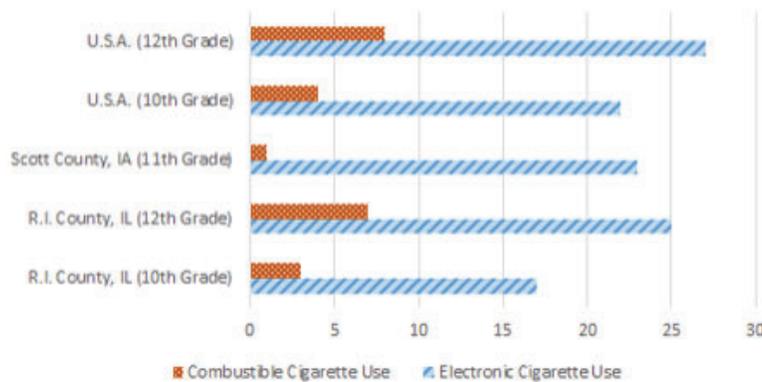
**We must take action now to protect the health of our nation's young people.  
Know the risks. Take action. Protect our kids."**

Courtesy of "Surgeon General's Advisory on E-cigarette Use Among Youth"

# ESD USE STATISTICS

After decades of decline, the CDC announced in 2017 that adult use of combustible cigarettes hit an all-time low. (6) Youth use of combustible cigarettes has also been decreasing regionally and nationally. According to the 2018 Iowa Youth Survey, only 1% of Scott County 11th-graders reported using combustible cigarettes within 30-days prior to the survey. (1) This is terrific news after many years of research, prevention education, and intervention methods.

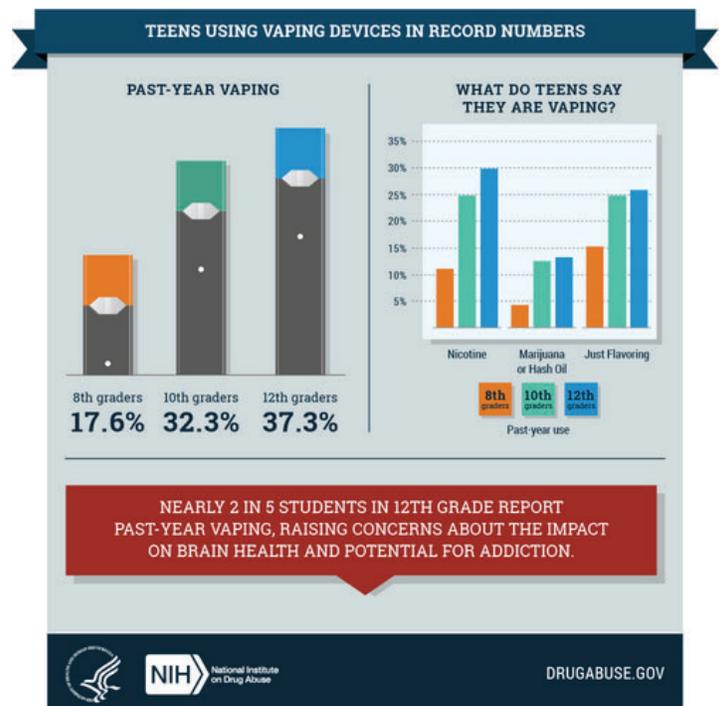
## HIGH SCHOOL CIGARETTE USAGE IN 2018



Graph courtesy of TFQC  
Sources: Iowa Youth Survey, Scott County Report 2010-18; Illinois Youth Survey, Rock Island Report 2010-18; Monitoring the Future Survey, 2010-2018

Unfortunately, both adolescent and adult ESD use is increasing at an alarming rate. More than 3.6 million middle and high school students used e-cigarettes in 2018. (7) This shows an increase of 78% from 2017 to 2018 alone. (7)

Locally, Scott County high school 11th-graders almost doubled their usage rate from 2016 to 2018, from 14% to 23%. (1) In 2018, one quarter of Rock Island County high school seniors reported using electronic cigarettes in the past 30-days. (17)



Infographic accessed on September 20, 2019 from Monitoring The Future's 2018 Survey Results at <https://www.drugabuse.gov/related-topics/trends-statistics/infographics/monitoring-future-2018-survey-results>

# JUUL EXPLAINED

JUUL Labs, Inc. is an e-cigarette company based in the U.S.A. that was founded by two former combustible cigarette users in 2017. The company's mission is to "improve the lives of the world's one billion adult smokers by eliminating cigarettes." (20) JUUL admits that nicotine is addictive and publicly states that their product is for current smokers, not non-smokers. "As scientists, product designers and engineers, we believe that vaping can have a positive impact when used by smokers, and can have a negative impact when used by nonsmokers. Our goal is to maximize the positive and reduce the negative." (20)

In December of 2018, Altria Group bought 35% of JUUL Labs, Inc. (23) Altria Group also owns well-known Phillip Morris USA and U.S. Smokeless Tobacco Company. Phillip Morris USA still owns and manufactures Marlboro cigarettes. (3)

When ESDs were first being produced, nicotine solutions were on average 1% - 2.4% concentrated. JUUL pods entered at more than twice that strength at 5%. (4, 16) Recently, they have started producing a 3% concentration as well. (5)

All JUUL pods include nicotine. (5)



Above photo courtesy of JUUL on September 16, 2019. Below image courtesy of Truth Initiative on September 16, 2019

**One JUUL pod**  
(at 5% nicotine concentration)  
**contains as much nicotine as**  
**one pack of cigarettes.**

JUUL was also one of the first companies to use nicotine salts in their e-liquid. They now have patented JUULSalts. (27) They claim to "deliver nicotine up 2.7 times faster" than other ESDs on the market. (11)

Traditional combustible cigarettes use free-base nicotine. Free-base nicotine can irritate the user's upper respiratory system. (12) Nicotine salts tend to have a smoother draw with less irritation. Free-base nicotine and nicotine salts also have different pH balances and are absorbed differently into the bloodstream, hence the quicker delivery of JUULSalts. (12)

**"You can have a less harsh vape (with nicotine salts) than you can with freebase with the same nicotine content. Combine that with the addiction that will follow with such a high dose of nicotine."**

**Odds of using JUUL**

**15- to 17-year-olds are**  
**16x**  
**more likely to use**  
**JUUL compared with**  
**those aged 25-34.**



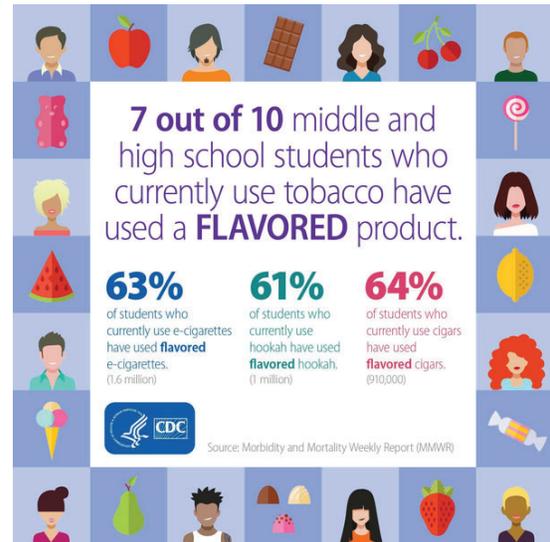
Above photo courtesy of JUUL on September 16, 2019

Apart from their high levels of nicotine and patented chemical formula, JUUL also provides a sleek and discreet vaping experience. The aerosol disperses quickly and doesn't leave a noticeable scent.

The Truth Initiative® conducted a study published in Health Promotion Practice that revealed that although 67.6% of school staff had heard of JUUL, only 47.3% could accurately identify a picture of a JUUL device. (25)

Many ESD companies use specific marketing strategies to appeal to youth. Tobacco product advertisements have been banned from television since 1971. (24) Billboard advertisements were banned in 1999. (24) Yet, there are no current restrictions on electronics smoking devices.

In June 2018, JUUL announced a change in their marketing. They would stop featuring models on social media accounts and start featuring former smokers who have switched from combustible cigarettes to electronic. (29)



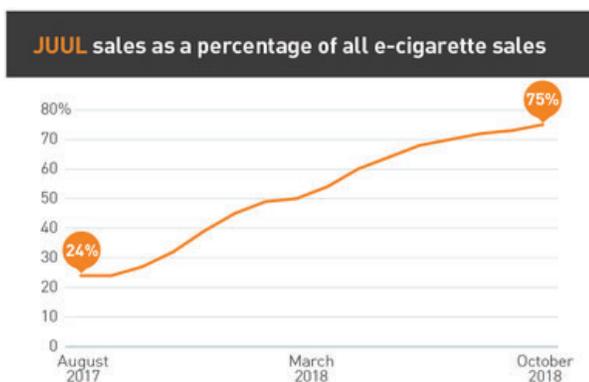
Above photo courtesy of CDC MMWR on September 16, 2019, originally published September 2015

Adjacent photo courtesy of JUUL on September 16, 2019



Kids and teenagers are also drawn to ESD companies due to the variety of flavors. In 2009, the Family Smoking Prevention and Tobacco Control Act banned "candy- and fruit-flavored cigarettes". (33) As of 2015, 63% of student ESD users had used flavored products. (2)

JUUL's starter pack includes four different flavors - Virginia Tobacco, Mint, Creme, and Mango. They also have Fruit, Menthol, and Cucumber flavors for sale. (5) In November 2018, JUUL stopped selling its flavored pods in brick-and-mortar stores in the U.S. (22) They do still sell their product online, which requires an age verification step. (5)



Source: Nielson: Tobacco "All Channel" Data. August 2017-October 2018

Above photo accessed from Truth Initiative's website on September 16, 2019

JUUL has become the top-selling ESD company. As of October 2018, they earn 75% of total e-cigarette sales in the U.S. (4)

JUUL's are popular, discreet, flavorful, and chemically designed to provide a strong nicotine "hit". These all lead to a much higher risk of nicotine addiction.

Please start a conversation about JUUL and other ESDs with your friends and family.

# CESSATION RESOURCES

## Truth Initiative

The Truth Initiative has many quit-smoking resources for children and teenagers. Youth can use a free, innovative text message program. Text "DITCHJUUL" to 88709 to get started. The text program is available 24 hours a day. For more information, click here or visit

<https://www.thetruth.com/articles/hot-topic/quit-vaping>



## Tobacco Free Kids

Tobacco Free Kids works on U.S. initiatives, global initiatives, and youth initiatives. Tobacco Free Kids is known for the Taking Down Tobacco training program and the National Kick Butts Day. Their website includes many facts about electronic smoking devices. For more information, click here or visit <https://www.tobaccofreekids.org/> to learn more.



## Illinois & Iowa Quitlines

The Illinois Tobacco Quitline and Quitline Iowa are free tools to help you quit using tobacco. Free resources are provided, including a counseling and quit plan.

ILLINOIS QUITLINE

[quityes.org](http://quityes.org)

1-866-784-8937



QUITLINE IOWA

[iowa.quitlogix.org](http://iowa.quitlogix.org)

1-800-784-8669



## Iowa Students for Tobacco Education and Prevention (ISTEP)

Schools can host an Iowa Students for Tobacco Education and Prevention (ISTEP) group in their schools. The peer groups help to influence and educate their peers about the dangers of tobacco and electronic smoking devices. The groups are simple to form and we can help you with free resources and assistance. For more information contact Kim Mills at 563-326-8618.



# TFQC COALITION

 TobaccoFreeQC@gmail.com

 (563) 326-8618

 Tobacco-Free QC Coalition

The Tobacco-Free QC (TFQC) is a bi-state coalition of community members, agencies and organizations dedicated to reducing the impact of tobacco in the Quad Cities community. The TFQC is a resource for information on tobacco, secondhand smoke, tobacco-free polices, smoke-free pledges, quitting tobacco use, and much more.

Since its inception, TFQC has assisted in creating smoke-free parks in East Moline and Moline. TFQC also advocates for smoke-free community housing. They continue to serve as resource of current information regarding the latest legislation, use statistics, and cessation help.

TFQC's mission is to reduce the impact of tobacco use in the QC.



TFQC was featured on WHBF's "Living Local" in January 2019. Shown are host Ashe Simpson and members Chris Pekios, Kim Mills, and Kristi Siwajek.

Tobacco Free Quad Cities members represent both sides of the Mississippi River and numerous local agencies, businesses, and initiatives. Representatives from the below agencies and businesses participate in coalition work.



The TFQC Coalition is always accepting new members - whether representing an agency or acting as a private citizen. Please call or message us to find out how you can help to reduce the impact of tobacco in the Quad Cities.

# NOTES & REFERENCES

Thank you for reading this informational booklet.

If you would like to continue your research, we have listed all of our sources below.

Tobacco-Free Quad Cities has also compiled a toolkit for teachers and parents. This free downloadable toolkit is available by request via email ([tobaccofreeqc@gmail.com](mailto:tobaccofreeqc@gmail.com)). TFQC hopes you enjoy the posters, tip sheets, and fast facts provided there. If you have further questions, please contact Tobacco-Free Quad Cities.

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