

# **E-cigs:** Vaping and the effects it has on your health.

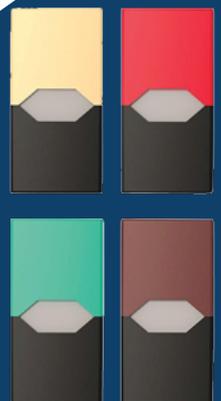
Do you know what's in your teen's Vape?



## **The Juul**

A Vaping device that looks like a USB drive. Trending among youth on high school and college campuses.

*See Page 3.*



## What is Vaping?

Vaping is the act of inhaling and exhaling the aerosol, often referred to as vapor, which is produced by an e-cigarette or similar device.

**1 in 5 middle school students** who reported ever using e-cigs say they have never tried traditional cigarettes.

*Source: Centers for Disease Control, National Youth Tobacco Survey, 2013*

**1 in 4 high school teens** who have used e-cigarettes have also tried a potentially dangerous new vaping method called “dripping”.

*Source: USA Today*

## How are Vaping Devices Used?



A vaping device typically consists of a mouthpiece, a battery, a cartridge for containing the e-liquid or e-juice, and a heating component for the device that is powered by a battery. When the device is used, the battery heats up the heating component, which turns the contents of the e-liquid into an aerosol that is inhaled into the lungs and then exhaled.

The e-liquid in vaporizer products usually contains a propylene glycol or vegetable glycerin-based liquid with nicotine, flavoring and other chemicals and metals, but not tobacco. Some people use these devices to vape THC, the chemical responsible for most of marijuana's mind-altering effects, or even synthetic drugs like flakka, instead of nicotine. *National Center on Addiction and Substance Abuse.*

## What is Dripping?

Differs from normal e-cigarette use that slowly releases the liquid from a wick onto a hot atomizer. May expose users to higher levels of nicotine and two harmful non-nicotine toxins, such as formaldehyde and acetaldehyde — known carcinogens.

**64% of the surveyed teens said they dripped for the thicker smoke, 39% for the better flavor and 28% for the stronger throat hit or sensation.** *Source: USA Today*

## Juices' and Nicotine E-liquids

The liquid that is used in electronic cigarettes is known as juice or e-liquid. Juices are usually made up of propylene glycol (PG - used in medicinal preparations among other applications), vegetable glycerine (VG) and food grade flavors.

### E-cig juice flavors

There are a huge range of flavors available - some mimic tobacco, others include coffee, caramel and menthol. Some juices may be sold as concentrates - i.e. you add them to a nicotine liquid/PG/VG base or a PG/VG base. Others will be sold as juices “ready to vape” either with or without nicotine. Be sure you know what you are buying.

### Nicotine liquids

Varying strengths of nicotine and toxic.



# What is a Juul?

(pronounced *jewel*)

A vaping device that's been trending on high school and college campuses doesn't look like a vaping device. The Juul vaporizer (stylized as "JUUL") looks like a USB flash drive.



**Juul Device**



**Juul Pods**

Students plug the Juuls into their laptops to charge them. Juul-issued flavor "pods," can deliver more than double the nicotine — and nicotine buzz — of other vaping products.

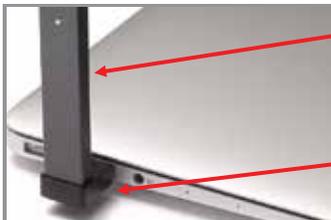
**One Juul pod contains as much nicotine as a pack of cigarettes.**



Cap can be removed and the pod is inserted into the end of the Juul device.



This is the charger device. It can be charged using a computer or any universal USB wall charger.



The Juul is shown here plugged into the charger device that is plugged into a computer.

# Interview of several teenagers:

## What is the most common "e-cig" being smoked by teens?

Juul and phix. Juuls are the most popular. Teens are moving away from the vape and prefer to use the Juul. They started with vaping a couple of years ago but that has now changed to Juuling.

## Why is the Juul preferred?

Easy to hide from parents and school. It's small and looks like a flash drive. Easy to charge: Plug into a laptop or wall outlet.

## How often do you use the Juul?

It varies, boys seem to use it more than the girls. Some boys start first thing in the morning. A significant amount of girls are also using it. They don't believe there is any danger in smoking it. They feel it's less nicotine than smoking cigarettes and healthier than smoking cigarettes.

## What is the typical cost?

A starter kit is about \$60.

## What is the most common way to purchase?

In Rockland County, they are commonly purchased at vape shops, 7-11 and the internet. They also purchase it from older kids.

## How does it work?

Using a small pod which equals a pack of cigarettes. Pods are then replaced.

## What do you like about smoking the Juul?

Social aspect, everyone is doing it. It started with vaping and doing tricks when blowing smoke. Now they are Juuling. Like the head rush.

Different flavored pods: Tobacco, mints, melon, mango, cool cucumber, crème brulee. The original vapes they didn't have a lot of nicotine but with the Juul, nicotine is part of it.

# Types of Vaping Devices

There are currently three main types of devices for vaping marijuana products: table top vaporizers, vape pens and dab rigs. There have been also some reports of utilization of e-cigarettes for hash oil vaporization.



**Traditional Desk Top Vaporizers** – Less of the THC is burned off than when smoked, vaporization may have a stronger psychoactive effect, but offers rapid onset of effects allowing the consumer to easily titrate dose to the desired effect.



**Dab Rigs** – Dabbing is a method to inhale cannabis vapor from concentrates, oils or extracts through a dab rig. The typical “dab” set-up involves a hand held torch and a type of bong or water pipe with a heating element that allows fast vaporization of cannabis concentrates. Vaporization through dabbing delivers a very high dose of THC in a short period of time.



**Vape Pens** – A newer method for vaporizing marijuana and are not well-studied. The first generation of vape pens are similar to e-cigarettes, designed to slowly heat oil cartridge contents to the point of vaporization. While they are marketed as convenient, safe and affordable, they are unregulated. Some of these vape pens come with a cannabis oil cartridge attached to it – once the oil is used up, the whole device is discarded. These vape pens are also called “e-joints” and have the appeal of being small, convenient to carry, and release almost no cannabis smell when used.

# Nicknames & Distinguishing Characteristics:

## First Generation

### Product Nicknames:

- Electronic cigarette
- Cig-a-likes
- Minis



### Distinguishing Characteristics:

- Physically similar to cigarettes
- Come in disposable or rechargeable forms
- May emit a light when the user puffs
- Shorter battery life than later generations
- Generally less expensive

## Second Generation

### Product Nicknames:

- Vape pens
- Mid-sized e-hookah

### Distinguishing Characteristics:

- Short for “vaporizer pen”
- Come in various sizes
- Not shaped like a cigarette
- Slim like a pen
- Can come in disposable or rechargeable forms
- Refillable with e-juice/e-liquid



## Third Generation

### Product Nicknames:

- Mechanical Modified Nicotine Delivery Systems (MODs)
- Vape MODs/personal vaporizer
- Electronic hookah



### Distinguishing Characteristics:

- Larger in shape and size
- Include modification options
- Have larger battery capacity and replaceable batteries
- Typically rechargeable
- Typically deliver more nicotine than earlier generations
- Electronic versions of hookah head and hookah bowl



## There is little consistency across different products.

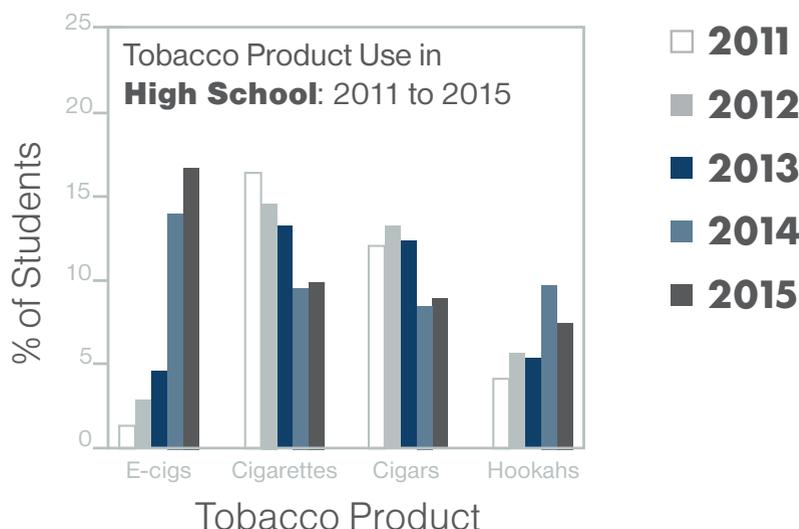
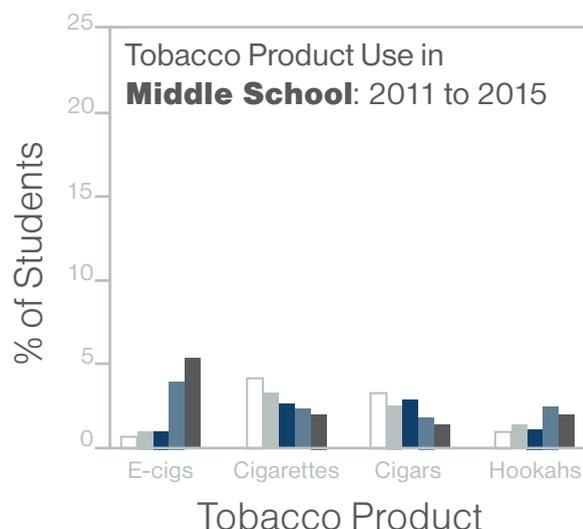
Until recently, there was limited federal oversight for e-cigarettes and other vaping devices, making it difficult to assess the dangers of any specific product. Across products, there was considerable variation in the nature and concentration of the ingredients, including nicotine and other known toxins.

## There is no evidence that the aerosol from these products is safe.

There is limited research into the long-term health effects of aerosolizing nicotine and other chemicals in e-cigarettes and other vaping devices. It is clear, however, that the additives, heavy metals, ultrafine particles, and other ingredients they contain include toxins and carcinogens.

## Trends & Popularity Among Youth

Vaping has grown in popularity with the rise of e-cigarettes, which were introduced to the mass market in the U.S. in 2007. Vaping devices include not just e-cigarettes, but also vape pens and advanced personal vaporizers (also known as 'MODS'). E-cigarettes, which resemble smoked cigarettes, and vape pens, which resemble large fountain pens, are typically simpler in design and less expensive than devices that have been customized by the user.



### Use of e-cigarettes tripled between 2013-2014 among middle and high school students.

According to a report published by the Centers for Disease Control and Prevention (CDC).

### Around 6 to 7% of students across all grades reported vaping marijuana

Dr. Richard Miech, of the Institute for Social Research at the University of Michigan and co-author - published in the journal Tobacco Control.

### Using e-cigarettes and other vaping devices is not a proven method for quitting smoking.

E-cigarettes and other vaping devices would be a preferred alternative to traditional cigarettes, when used exclusively as a replacement and only among smokers who have been unable to quit smoking using proven, medically approved methods. However, there is little evidence that they reliably reduce cigarette smoking or lead to smoking cessation.

### E-cigarettes and other vaping devices are not used exclusively by people trying to quit smoking.

They are increasingly popular with young people, including those who had never smoked cigarettes previously and never intended to. Research shows that some young people begin to smoke cigarettes only after using e-cigarettes.

**E-cigarettes and other vaping devices are frequently used in addition to smoked cigarettes, rather than in place of them.** Many smokers use these products alongside traditional cigarettes, often at times and in places where smoking is not allowed or is not convenient.

**MANY e-cigs are being hacked to be used with THC (marijuana) oil or wax.** They are becoming drug dispensing devices.

The spread of e-cigarettes and other vaping devices may be re-normalizing smoking behavior. The increase in nicotine devices and products and their widespread availability is reversing some of the progress made over decades of intense global, national, and local efforts to reduce cigarette smoking, especially among young people.

# Health Risks & Consequences

E-cigarettes and other Vaping Devices are NOT Risk-Free. There is no evidence that E-cigarettes are Risk-Free.

They may lead to negative health consequences, including:

- Damage to the brain, heart and lungs
- Cancerous tumor development
- Preterm deliveries and stillbirths in pregnant women
- Harmful effects on brain and lung development, when use occurs during fetal development or adolescence
- They contain nicotine, a highly addictive drug with known health risks.

Some Side Effects:

- Dry skin and dry mouth
- Rash/burning sensation on face
- Itchiness
- Puffy/dry eyes
- Caffeine sensitivity
- Minor nose bleeds
- Nausea

Other various studies indicate:

- Vaping lowers the body's ability to fight infections
- Chemicals in vape smoke causes "popcorn lung"
- Lithium ion-powered vapes can blow up
- The levels of nicotine are loosely monitored
- Accidental ingestion of vape liquid is poisonous
- Metal particles are found in vape smoke
- Vapes also contain formaldehyde, or embalming fluid
- Pneumonia is a risk for vape users
- E-cigarette usage is linked to depression



**Using nicotine increases the risk of addiction.** Nicotine addiction is difficult to reverse, and addiction to e-cigarettes can lead to using other nicotine products, including smoked cigarettes, as well as alcohol and other drugs.



**Nicotine can affect brain development and functioning in young people.** Young people are particularly vulnerable to using e-cigarettes and vaping devices and to their effects. The younger a person is when he or she tries nicotine, the greater the risk of addiction. The developing brain is more vulnerable to the effects of addictive substances than a fully developed adult brain. Additionally, nicotine can disrupt brain development, interfere with long-term cognitive functioning, and increase the risk of various mental and physical health problems later in life. The brain is not fully developed until age 21.



**E-cigarettes and other vaping devices are not FDA approved.** These products are not approved by the U.S. Food and Drug Administration (FDA) as a smoking cessation aid. Until very recently, manufacturers and distributors of e-cigarettes and other vaping devices were not bound by standards of safety set by the FDA for smoked tobacco products. Despite the new regulations, e-cigarette manufacturers are free to project a risk-free image in their marketing, and offer enticing, candy-like flavors that appeal to children, adolescents and young adults.



## Steven Kanengiser, M.D.

### Director of Pediatric Pulmonology



Vaping is the latest high-tech way of inhaling tobacco and other substances. Vaping is marketed as a cleaner and safer way of smoking cigarettes - but there is no definitive data to support that. In fact, children and teens who vape are more likely to smoke traditional cigarettes in the future: in one study, teens who vaped were up to seven times more likely to smoke traditional cigarettes later on. Vaping is not a safe alternative to cigarette smoking.

Users of vaping devices can also easily adapt them to smoke other materials, like cannabis. And the solution in the devices and vapor contains a number of harmful chemicals besides nicotine, like antifreeze, diethylene glycol, and potentially cancer-causing chemicals like nitrosamines.

Unfortunately, more and more teens are using these devices. While 1.5 percent of teens were using e-cigarettes in 2011, that rate soared to 16 percent in 2016, or more than one in seven teens. The devices are heavily advertised on TV and social media, and some of the products are offered in liquid flavors that are appealing to children and teens. And while it is illegal to sell these devices to anyone under 18 years of age, children and teens can find ways to order them online.

These devices go by many names, including e-cigarettes, e-cigars, vape pens, personal vaporizers, or vaping devices. They can look like traditional tobacco products like cigarettes, cigars, pipes, or common modern gadgets like pens, flashlights, or flash drives. The official name for these devices is electronic nicotine delivery systems, or ENDS - and nicotine is an addictive substance that can impede brain development.

The American Academy of Pediatrics is working to prevent children and youth from using or being exposed to the vapor from ENDS. Using and abusing the newest electronic nicotine delivery system (ENDS) is just one of the latest risky activities among today's youth.

## Glossary of Terms

**Analog:** A traditional tobacco cigarette that involves combustion to produce smoke, as opposed to an electronic cigarette that produces vapor.

**Atomizer:** The standard heating element in an e-cig. As it warms up, the atoms that make up the e-juice move faster, which transforms the liquid into vapor.

**Battery:** The heating element's power source. E cig batteries vary between lithium polymer and lithium-ion and can be replaceable or integrated into the device.

**Blend:** A fancy term for the ratio of propylene glycol to vegetable glycerin in an e-liquid.

**Box Mod:** A type of mod supported by a big, box-shaped battery.

**Cartomizer:** A cartridge with a built-in atomizer. They can be disposable or refillable.

**Cartridge:** A removable container that holds e-liquid ready for use. They often include an absorbent filler material.

**Cig-a-like:** An e cig designed to look like a tobacco cigarette.

**Clearomizer:** A clear cartomizer with visible e liquid.

**Cloudchaser:** A vaping enthusiast who loves making big vapor clouds.

**Clouds:** A large plume of vapor produced by heating e-liquids to high temperatures.

**Coil:** The metal conductor for the heating element.

**Drip Tip:** A removable e cig mouthpiece.

**Dripping:** Putting e liquid directly onto the heating element as opposed to using a cartridge or cartomizer.

**Dry Burn:** A technique for cleaning atomizers by burning the coil in short durations with no e-juice present.

**Dry Hit:** A harsh tasting hit resulting from an insufficient supply of e-juice.

**E cig/E-cig:** Short for electronic cigarette.

**E liquid/E juice:** Synonymous terms for the flavored liquids e cigs use to produce vapor.

**Lung Hit:** Inhaling vapor directly into the lungs.

**Mechanical Mod:** A mod that lacks safety features commonly found in pre-manufactured devices.

**Mod:** A type of e cig made up of separable components. The term originally applied to personal vaporizers that had been either modified from a pre-manufactured e cig or built from scratch to meet the specific desires of the user; however, the term is now commonly used to describe any e cig that isn't a cig-a-like.

**Mouth Hit:** Drawing vapor from an e-cig into the mouth before either inhaling it into the lungs or blowing it back out.

**Nic/No-Nic:** E liquids with or without nicotine.

**Ohm:** The scientific measure of electrical resistance. Lower resistance results in faster heating.

**PG:** Propylene glycol, a common base for e-liquids.

**Regulated Mod:** A mod with safety features to prevent overheating.

**Resistance:** The rate at which electricity travels through the heating element.

**Tank:** The reservoir for e liquid to be used with an e cig.

**Threading:** The type of connection used to attach the e liquid container to the device.

**Throat Hit:** A draw that you can feel tingling the back of your throat - usually associated with higher nicotine levels.

**Unregulated Mod:** Another term for mechanical mod.

**Vaper's tongue:** A temporary dulling of the sense of taste that sometimes follows intense vaping sessions or vaping the same flavor for long periods of time.

**VG:** Vegetable glycerin, another common e-liquid base.

**VV:** Variable voltage, or the ability to control an e cig's voltage.

**VW:** Variable wattage, or the ability to control an e cig's wattage.

**Wick:** An absorbent material that draws e-liquid onto the heating element.

# MAKING A DIFFERENCE **TOGETHER**

