

# THC and Vaping

Sarah E. Bauer, MD

Teen Vaping ECHO

November 19, 2020



Riley Hospital for Children  
Indiana University Health



INDIANA UNIVERSITY  
SCHOOL OF MEDICINE

## Disclosures / Conflicts of Interest

- None

## Acknowledgements

- Thank you to Zachary Adams for sharing much of this content and his slides.



## Outline

1. Background
2. Trend of use among adolescents
3. Associated risks
4. Recommendations



## Cannabinoids

- Biologically active molecules
- Bind to receptors in the brain, nervous system, immune system
- Humans make endocannabinoids
- 3 FDA approved cannabinoids
- Delta-9-tetrahydrocannabinol (THC) is a psychoactive cannabinoid



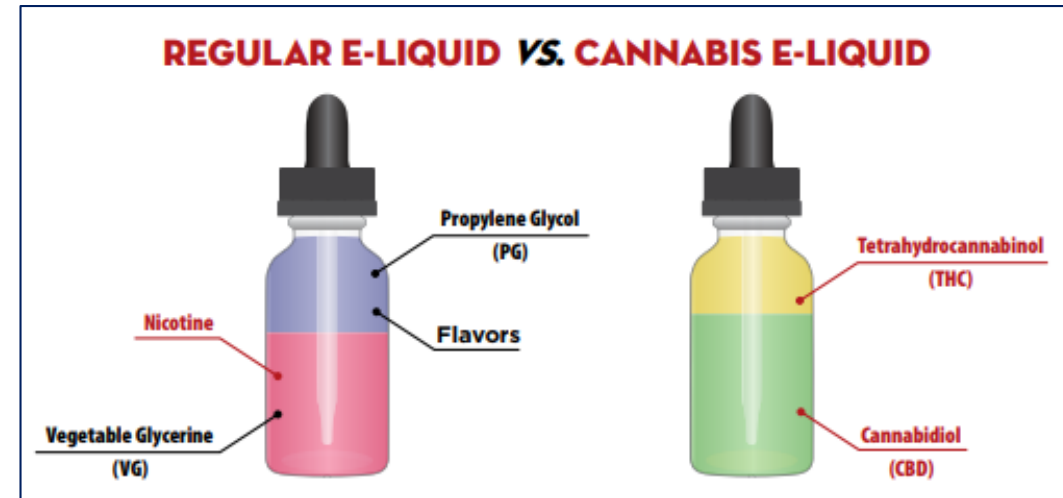
## Marijuana Plants

- Contain more than 200 cannabinoids
  - Tetrahydrocannabinol (TCH)
  - Cannabidiol (CBD)
- 2 major species
  - Sativa
  - Indica
- Cross breeding can increase cannabinoid concentration



# Delta-9-tetrahydrocannabinol (THC)

- Extracted from marijuana as concentrates
- Derived products may contain very high dosages of THC
- Ingested, smoked, aerosolized



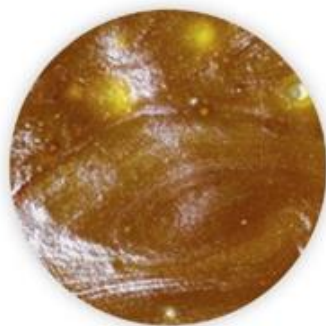
***“Concentrates are very potent,  
so a little goes a long way.”***



**HASH**



**BUBBLE HASH**



**HASH OIL**



**WAX**



**SHATTER**



**LIQUID THC**

## Composition of THC Vaping Products

- THC concentrations in vaping products can be 4-30x higher than dried cannabis leaves
  - Marijuana cigarettes: ~15-20% (increasing; 1995: 4%, 2014: 12%)
  - Solvent-based extracts: ~54-80+%
  - Non-solvent-extracts: ~39-60%
- Vaping products can contain concentrated levels of solvents, pesticides, toxins
- Overheating of cannabis vaping products can lead to inhalation of carbon-monoxide, tar, and ammonia



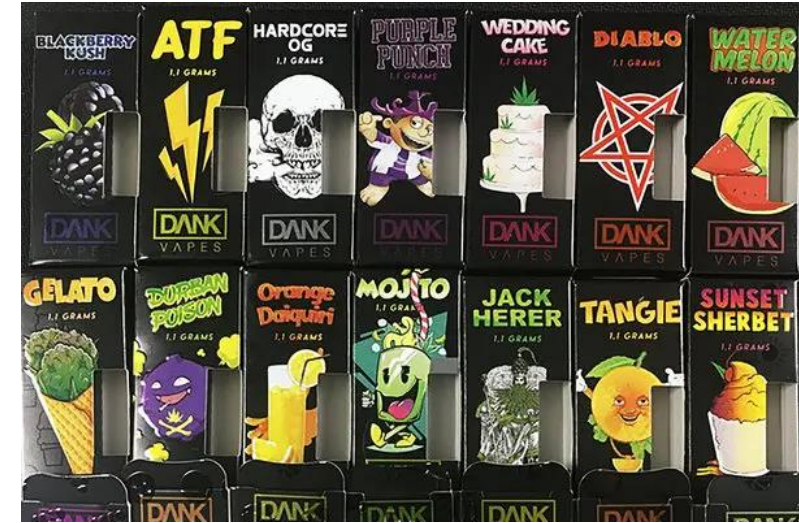


# Devices used to aerosolize THC

- Tabletop units
- Disposable vape pens
- Pre-filled cartridges
- Refillable Vaporizers



Torch



Dray Dry Herb Vaporizer



The PAX 2 and 3



Khan Dry Herb Vaporizer



The Crafty Vaporizer



Mig Vapor Sol E-Nectar Collector



DaVinci IQ



Herb-E



Pro 50 Combustor



Mig Vapor - Mig Rig (formerly known as La Queef)



Volcano Vaporizer



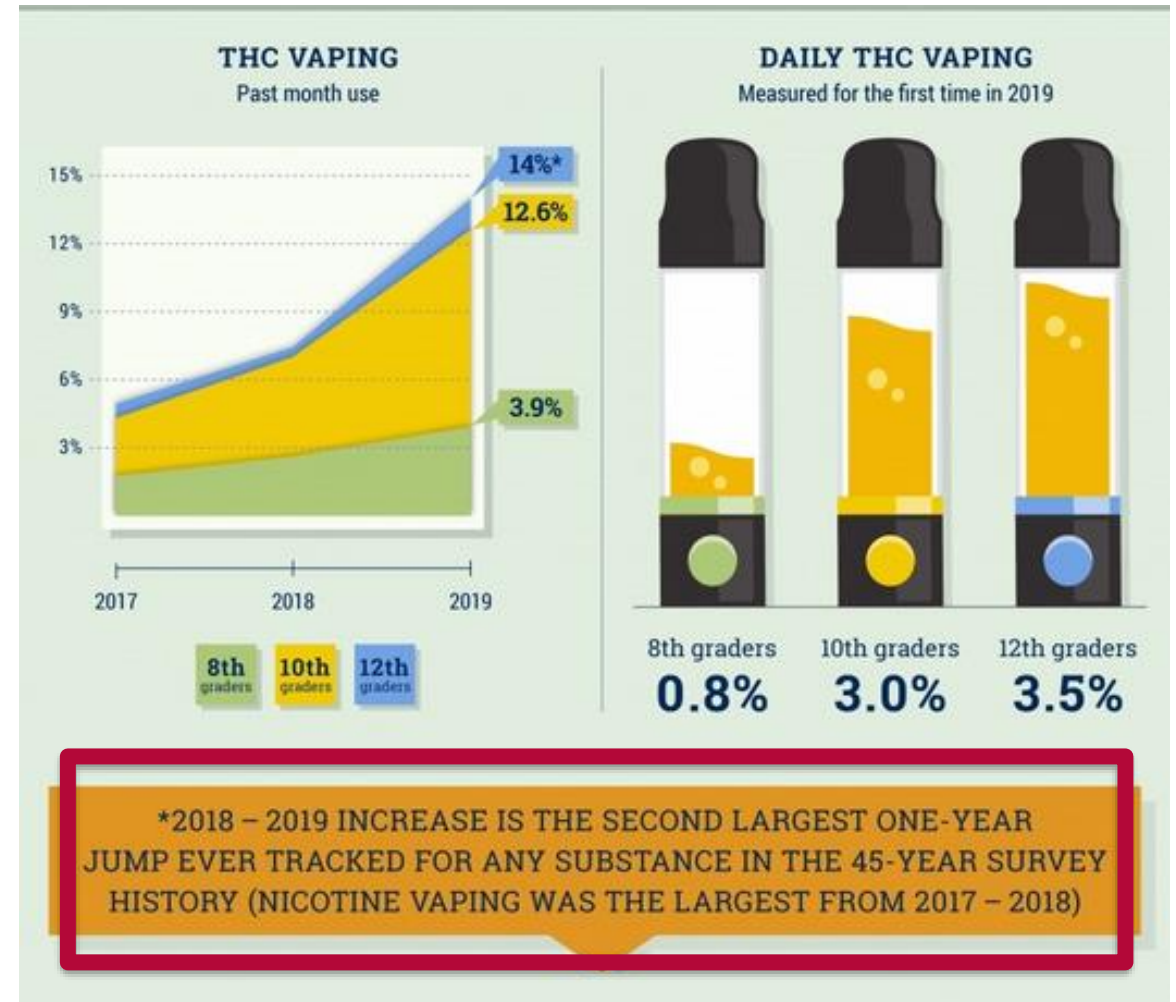
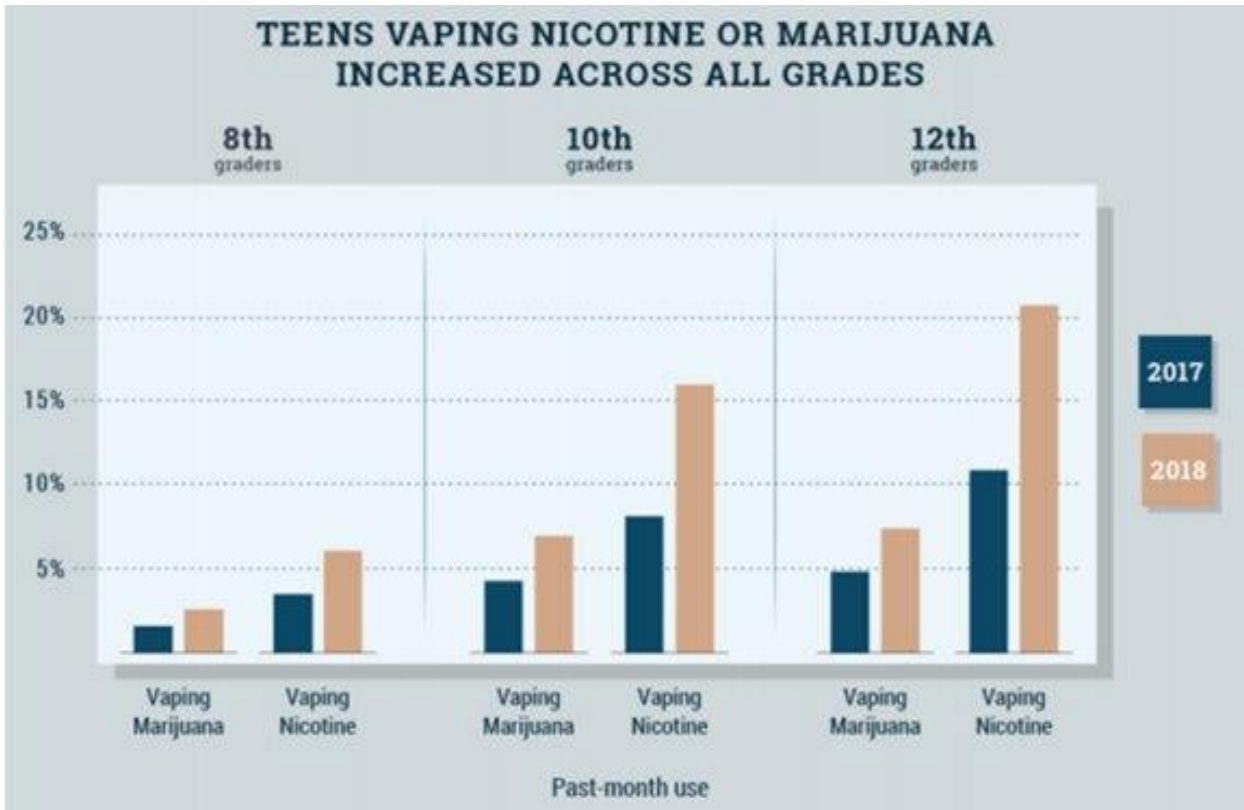
The Dr. Dabber Switch

## Vaping THC-containing products

- Results in stronger effects and higher peak concentrations of THC in blood compared with equal doses of smoked cannabis
- Blood THC concentrations peak within 30 minutes and return to baseline within 3 to 4 hours
- However, subjective drug effects such as cognitive and psychomotor impairments persist for up to 6 hours on average



# THC Vaping among adolescents increasing



## Prevalence of Vaping THC vs. Nicotine/Tobacco Products

Grade	THC Vaping	Nicotine Vaping
8 <sup>th</sup>	3.9%	9.6%
10 <sup>th</sup>	12.6%	19.9%
12 <sup>th</sup>	14%	25.5%





## TEENS REPORT REASONS FOR VAPING



## Associated Risks

- High risk of developing dependence / addiction with exposure to high concentrations of THC
- Higher doses associated with anxiety, agitation, paranoia, psychosis
- Butane extraction – burns, explosions
- Cannabis hyperemesis syndrome



## Associated Risks

- THC-containing products, particularly from informal sources linked to most cases of EVALI
- Vitamin E acetate strongly linked to EVALI outbreak
- Case reports and series of adolescents with a history of THC containing e-cigarettes and acute respiratory distress / complications





# Vaping Illness Update: FDA Warns Public to Stop Using Tetrahydrocannabinol (THC)-Containing Vaping Products and Any Vaping Products Obtained Off the Street

*FDA strengthens warning to public to stop using THC-containing vaping products and any vaping products obtained off the street.*

Subscribe to Email Updates

Share

Tweet

LinkedIn

Email

Print

## Consumer Updates

[Animal & Veterinary](#)

[Children's Health](#)

[Cosmetics](#)



Content current as of:

10/04/2019

Regulated Product(s)

Tobacco





## Associated Risks

- Difficulty thinking and problem solving
- Problems with memory and learning
- Impaired coordination
- Difficulty maintaining attention
- Decline in school performance
- Increased risk of mental health issues
- Increased likelihood of risk-taking behaviors (e.g. impaired driving)



## Recommendations

- Screen and assess for THC use – quantity, frequency, duration, products used, method, dosing
- Educate adolescents and parents on risks of high potency THC consumption
- Recognize symptoms of cannabis overconsumption (drowsiness, confusion, rapid heart rate, irritability, panic, anxiety, nausea/vomiting, short-term psychosis)
- Treatment for cannabis use disorder, when indicated
- Counsel and encourage cessation or continued avoidance



## Summary

1. THC is the psychoactive cannabinoid in marijuana
2. TCH concentrates contain high levels of TCH
3. There are many different devices used to vape THC
4. There continues to be a worrisome trend of increasing use of THC vaping among adolescents and young adults
5. Vaping THC is associated with numerous adverse risks
6. Adolescents should be screened for, educated about, and counseled against THC use



Thank you.



Riley Hospital for Children  
Indiana University Health



INDIANA UNIVERSITY  
SCHOOL OF MEDICINE