

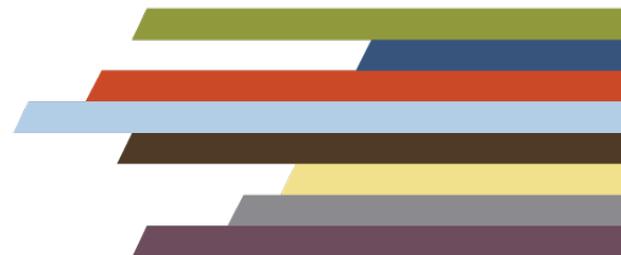


PTTC

Prevention Technology Transfer Center Network
Funded by Substance Abuse and Mental Health Services Administration

The Varied Forms, Potency, and Health Effects of Today's Cannabis

Key Information for Prevention Practitioners to Share with Key Stakeholders and Communities

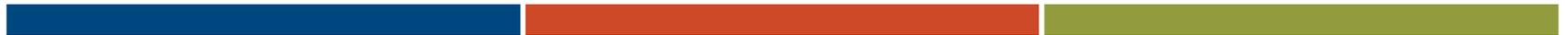




Acknowledgements

This slide deck was created in collaboration with the Prevention Technology Transfer Center Network Marijuana Risk Working Group, comprised of the following PTTC's:

- New England PTTC HHS Region 1
 - Great Lakes PTTC HHS Region 5
 - Pacific Southwest PTTC HHS Region 9
 - Northwest PTTC HHS Region 10
 - National American Indian and Alaska Native PTTC
 - National Hispanic and Latino PTTC
 - PTTC Network Coordinating Office
-
- The Prevention Technology Transfer Center Network is funded by the Substance Abuse and Mental Health Services Administration.





Purpose



Improve implementation and delivery of effective substance use and misuse prevention interventions



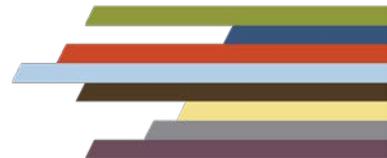
Provide training and technical assistance services to the substance use and misuse prevention field

- Tailored to meet the needs of recipients and the prevention field
- Based in prevention science and use evidence-based and promising practices
- Leverage the expertise and resources available through the alliances formed within and across the HHS regions and the PTTC Network.



PTTC

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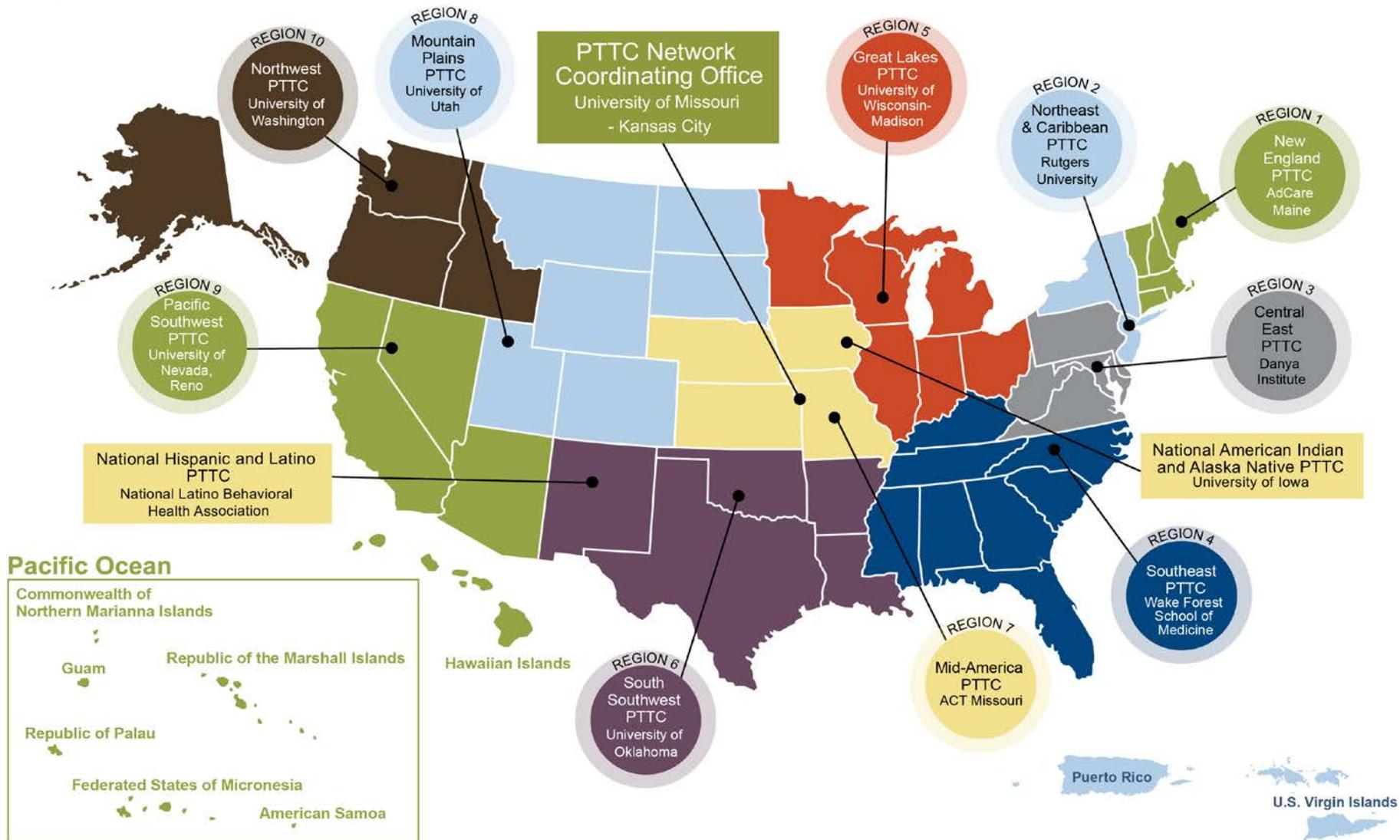




PTTC

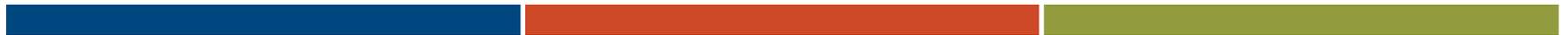
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PTTC Network





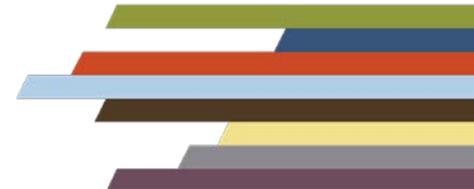
How has Marijuana use Changed over the past 50 years



Common Routes of Administration

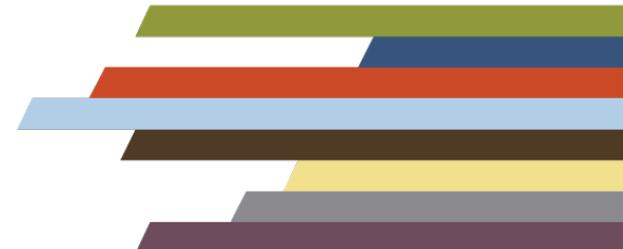


- Inhalation
 - Smoked forms
 - ENDS & Vaping Devices
- Marijuana Concentrates
- Oral ingestion
 - Edibles
 - Tinctures
- Topical administration





SMOKED FORMS OF MARIJUANA

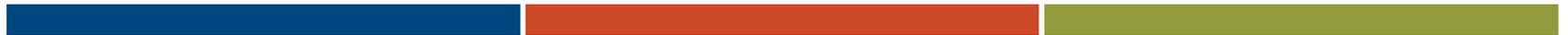




Smoked Forms of Marijuana

Smoking marijuana remains one of the most popular forms of marijuana consumption. Forms of smoked marijuana include:

- Joints
- Blunts
- Pipes
- Hookah pipes
- Homemade delivery vessels

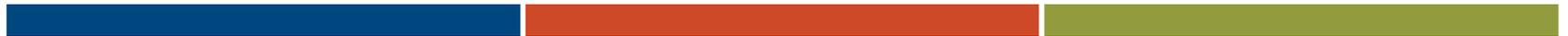


Breathing Problems



- Marijuana smoke contains many of the same components as tobacco smoke, which can irritate the lungs.
- Complications that can arise from smoking include:
 - Daily cough and phlegm
 - more frequent lung illnesses
 - longer recovery from illnesses such as colds
 - higher risk of lung infections

(National Academies of Sciences, Engineering, and Medicine, 2017).



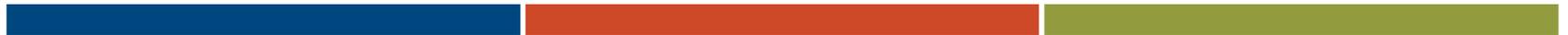


Marijuana smoke

- Classified as a Carcinogen in California
- At least 33 chemicals in tobacco and marijuana smoke are classified as carcinogens under CA prop 65:
 - Benzene
 - Benzopyrene
 - Arsenic
 - Formaldehyde
 - Mercury
 - Naphthalene



According to Tomar, Beumont, and Hsieh (2009), “In summary, there is some evidence from studies in humans that marijuana smoke is associated with increased cancer risk.”





Second-Hand Smoke

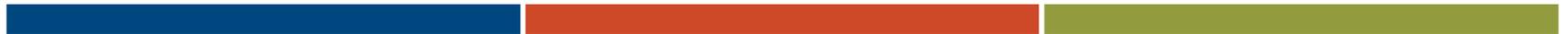
NEWS

Are There Risks From Secondhand Marijuana Smoke? Early Science Says Yes

Now that marijuana is legal in more than 20 states, we all may be exposed to more marijuana on the street. Researchers warn that secondhand smoke from pot poses risks to the heart, lungs and arteries.

MARISSA ORTEGA-WELCH, NPR | MARCH 19, 2018, 2:52 PM

According to Ortega-Welch (2018), “Springer demonstrated that, at least in rats, the same physiological effect occurs after inhaling secondhand smoke from marijuana. And, the arteries take 90 minutes to recover compared to the 30 minutes with cigarette smoke.”

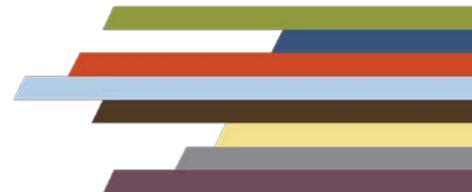
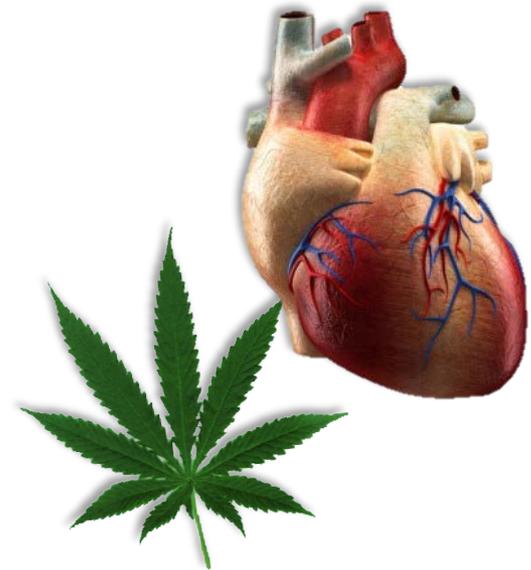


Effects on the Heart

Marijuana can cause the heart rate to increase by 20 to 50 beats per minute. This increase can last for hours after use has stopped.

Increased heart rates can be even greater if other drugs are used at the same time.

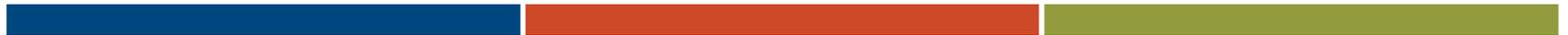
(Mittleman, M., et.al. (2001).





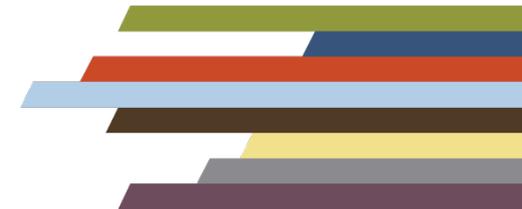
Nausea and Vomiting

- People who use marijuana regularly and over a long length of time can be at risk of developing Cannabinoid Hyperemesis Syndrome aka "Cyclical Vomiting Syndrome"
- Symptoms include:
 - severe nausea
 - vomiting
 - dehydration
- Cases can be severe enough to require emergency medical services (Galli J., Sawaya R., and FriedenberG F., 2011)





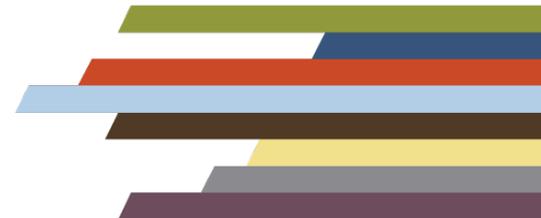
ENDS/VAPING DEVICES





Electronic Nicotine Delivery Systems or Vape Pens

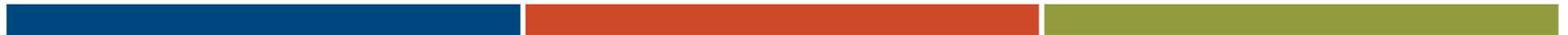
- Electronic Nicotine Delivery Systems (ENDS) aka Vaping Devices, are electronic devices used for the inhalation of vaporized solutions, such as those containing nicotine.
- ENDS are also commonly used with solutions containing THC.
- Vaping devices and THC vaping solutions are often sold at marijuana dispensaries.





Other common names for ENDS products

- e-cigs
- Vapes
- E-hookahs
- Vape pens
- Mods
- Tanks
- Usage of these devices is commonly referred to as: “vaping”, “juuling”, or “dabbing”



“VAPING”: Causes the oils in the extract to heat up to the point where they are released as an aerosol





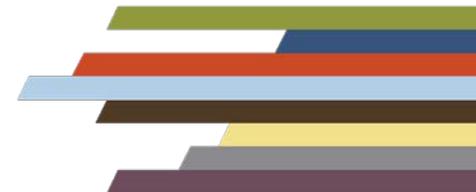
There are many artfully concealed vaping devices on the market as well as the openly obvious devices.





How ENDS are used

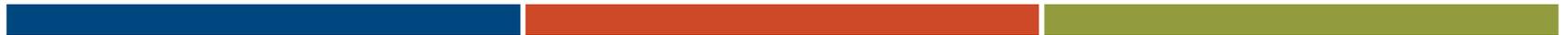
- Devices are commonly used with cartridges that include a solution that may contain nicotine, THC, or e-juices.
- “Dripping” involves dropping the solution directly onto the heated coils of the device which can result in a high concentration of the given compound
- “Dabbing” refers to the usage of highly potent solutions with ENDS devices, such as highly potent THC solutions.





ENDS Aerosols

- There can be a common misperception that the aerosols generated by ENDS are safe, or safer than traditional nicotine products because it isn't smoke being produced (U.S. Surgeon General, 2018).
- Analysis of these aerosols have found potentially harmful substances such as volatile organic compounds, heavy metals (e.g. tin, lead, and nickel), and chemicals known to cause cancer (U.S. Surgeon General, 2018).
- Aerosols may also contain ultrafine particulates that can settle and accumulate in lungs leading to significant respiratory difficulties and symptoms (U.S. Surgeon General, 2018).



Anatomy of a Vape Pen

To smoke, user pushes a button to activate an electronic controller (in other models, such as disposable e-cigarettes, this is activated when user inhales).

User inhales vapor through the mouthpiece and exhales a cloud that appears smoky, thanks to glycerol or propylene glycol.



Control

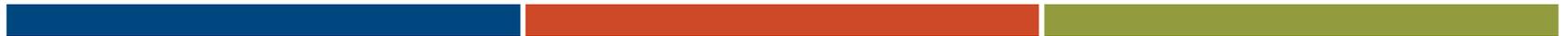
Vapor

Heat & Juice

Power

Rechargeable lithium-ion battery powers the e-cigarette.

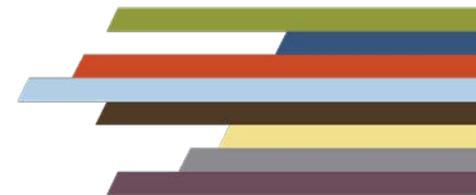
Heating element, called an atomizer, vaporizes e-liquid, an aqueous solution of glycerol or propylene glycol, flavoring, and optional nicotine. This reusable e-cigarette has a refillable cartridge with an atomizer, wicks, and e-liquid known as clearomizer or cartomizer.



JUUL



- Sleek and resembles a flash drive
- Rechargeable via USB
- Aerosol cloud dissipates very quickly
- Cartridges may contain e-juice, nicotine, or THC
- Cartridges are highly concentrated whether it is nicotine or THC



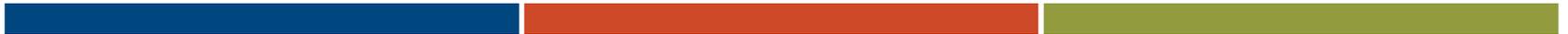


The New York Times



Did Juul Lure Teenagers and Get 'Customers for Life'?

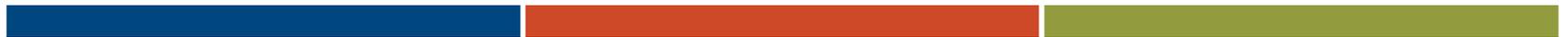
The e-cigarette company says it never sought teenage users, but the F.D.A. is investigating whether Juul intentionally marketed its devices to youth.





CDC Health Advisory

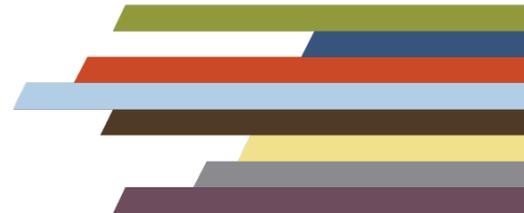
- The CDC issued a Health Advisory for ENDS products on August 30th, 2019, and is providing regular updates.
- In response to an outbreak of over 805 possible cases of pulmonary disease that appeared to be associated with the usage of ENDS devices (CDC, 2019).
- The CDC is conducting epidemiological investigations to better understand the etiology of these cases.
- Many patients reported using ENDS products containing cannabinoids including THC and CBD (CDC, 2019).





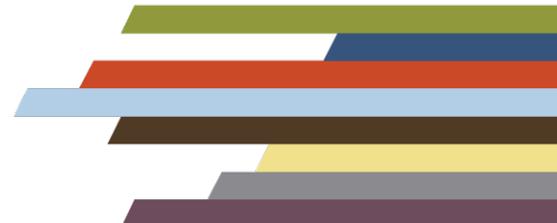
Reported Health Effects

- Cough
- Shortness of breath
- Chest pain
- Nausea
- Vomiting
- Diarrhea
- Fatigue
- Fever
- Weight loss





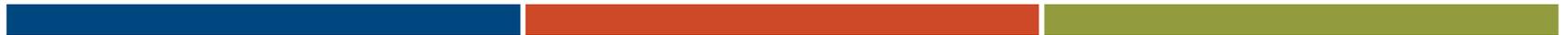
MARIJUANA CONCENTRATES





Marijuana Concentrates

- Made by extracting THC from marijuana by using solvents such as butane, which are highly flammable. (DEA, 2019)
- Resulting product is a sticky, or wax-like mass that can look similar in consistency to honey, butter, or ear wax. (DEA, 2019)
- Some products may have more of a brittle-like consistency, and can be commonly referred to as 'shatter.' (DEA, 2019)
- Final products can have potencies of 40 – 80% THC. Users may have a high that lasts up to 24 hours. (DEA, 2019)
- Concentrates are legal in states that have legalized marijuana and are sold in retail marijuana dispensaries.







How Concentrates Are Used

Concentrates can be used in various ways: (DEA, 2019)

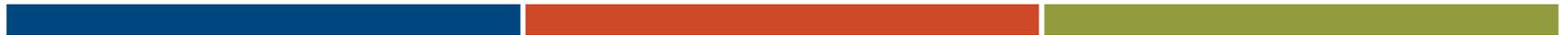
- Consumed orally as infused in edible or drinkable products
- Used in a e-cigarette or vaping device
- Smoked using water or oil pipes, also known as oil rigs
- Using concentrates in a vaping device or pipe is often referred to as “dabbing”





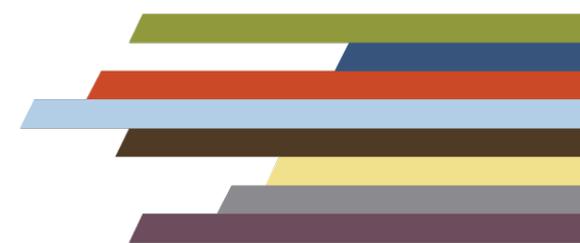
Hazards of Home Production of Concentrates

- Despite availability of concentrates in dispensaries, amateur production of concentrates persists, including in legalized states (Al-Zouabi, I., Stogner, J., Miller, B., and Lane, E., 2018; Rosenthal and Downs, 2014).
- Amateur concentrate production often takes place in settings such as garages, tool sheds, and vacant homes (Al-Zouabi, I., Stogner, J., Miller, B., and Lane, E., 2018; Rosenthal and Downs, 2014).
- Butane removed from the products can build up in these spaces and then be ignited by sparks or static electricity, causing explosions (Al-Zouabi, I., Stogner, J., Miller, B., and Lane, E., 2018; Rosenthal and Downs, 2014).
- Amateur home production of concentrates creates public safety hazards to the manufacturer and surrounding properties (Al-Zouabi, I., Stogner, J., Miller, B., and Lane, E., 2018; Rosenthal and Downs, 2014).





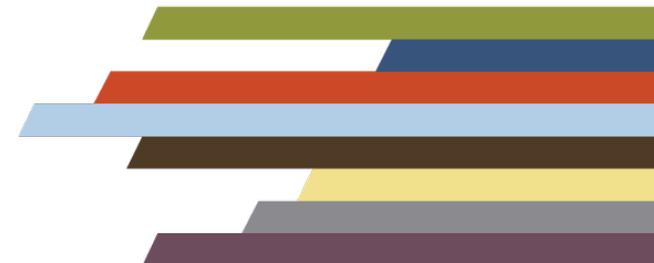
ORAL CONSUMPTION: EDIBLES & TINCTURES





Marijuana Edibles

- Due to its fat-soluble properties, THC can be infused into many kinds of edible products. (Priyamvada Sharma, PhD, et al. 2012)
- Edible products can include candies, baked goods like cookies and brownies, and drinkable products.
- THC can also be infused in butter and cooking oils allowing it to be incorporated into many other types of dishes such as pasta, proteins, and more.





Delayed Effects of Marijuana Edibles

- THC hits the bloodstream differently when marijuana is being consumed as an edible vs smoked or vaporized forms (NIH, 2019).
- Because edibles are processed through the stomach and liver, the onset of psychoactive effects can be anywhere from 1 to 3 hours after consumption (NIH, 2019).
- This poses additional risks for impaired driving, particularly amongst youth and new adult users of marijuana who are unaware of the delayed onset.





Marijuana Edibles



Many Edible Products Will Appeal to Youth





(Shop window with cannabis products. Photo by nicolette)





Study: Edible pot sickens more kids



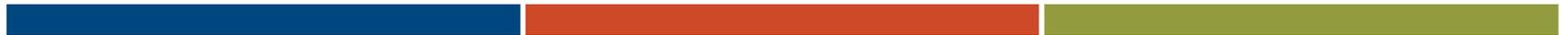
“The mean rate of marijuana-related visits to the children's hospital increased from 1.2 per 100 000 population 2 years prior to legalization to 2.3 per 100,000 population 2 years after legalization ($P = .02$). Known marijuana products involved in the exposure included 30 infused edibles (48%).” (*JAMA Pediatrics*, 2016)



Tinctures



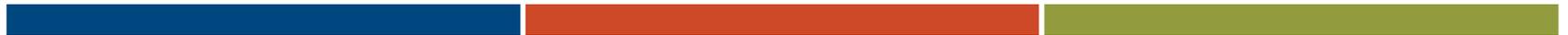
- Alcohol-based cannabis extracts.
- Products are manufactured with varying THC potencies
- Used by dropping under the tongue.
- Also used by adding to food or beverages



Topical applications

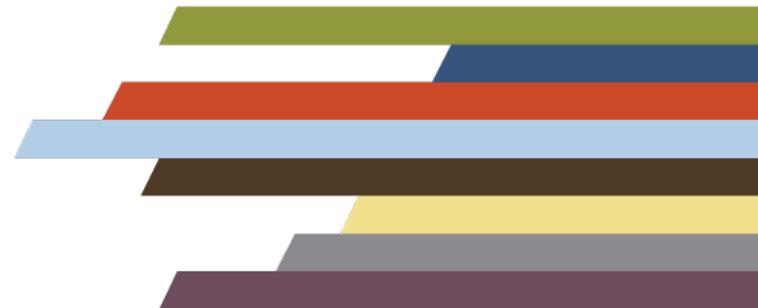


- Lotions, salves, oils, or sprays infused with cannabinoids, including THC and CBD.
- Can also be manufactured in the form of transdermal patches.
- Lotions, salve, oils, and sprays typically don't reach the bloodstream and thus don't have psychoactive effects.
- Transdermal patches can reach the bloodstream and if containing THC can potentially have psychoactive effects.





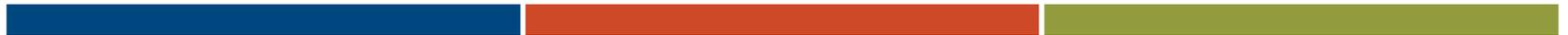
POTENCY





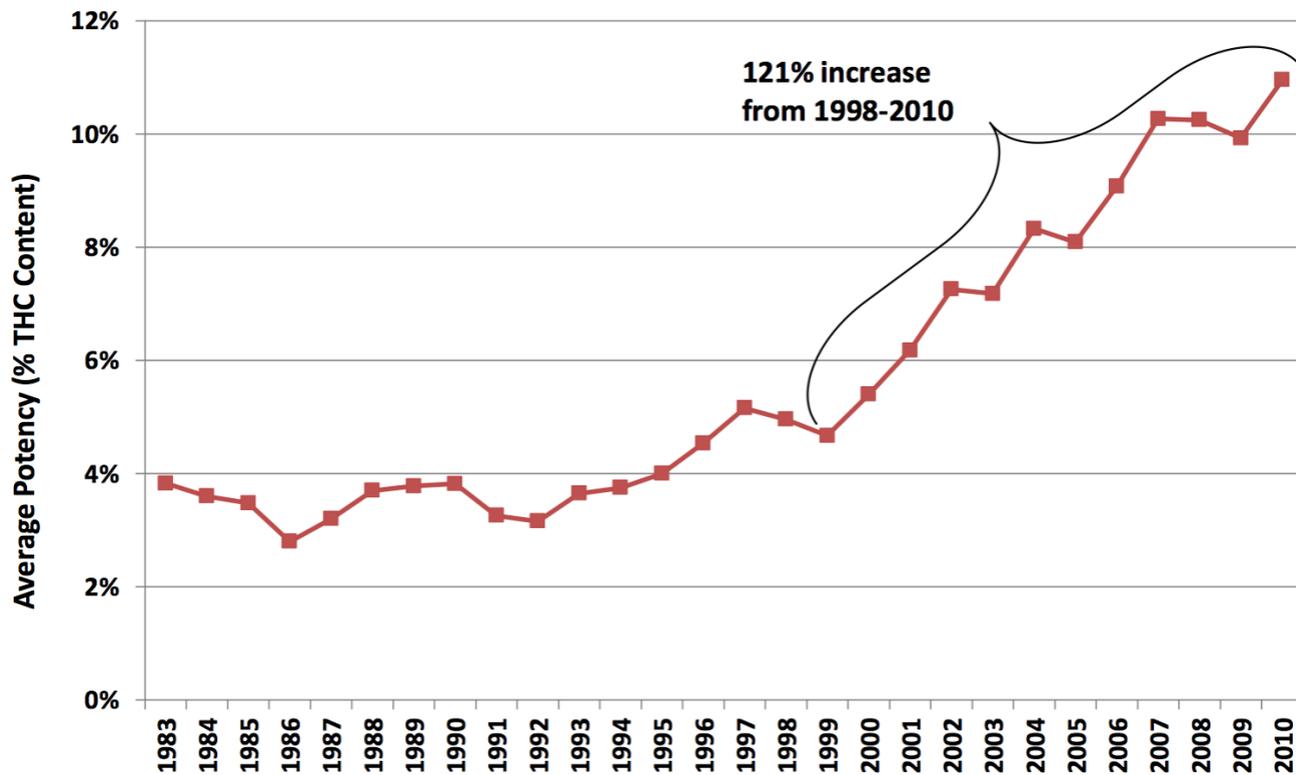
Today's Marijuana and Potency

- According to Chandra, et.al.(2010), “Today’s marijuana is far more potent: The average THC content in marijuana has risen dramatically over the past 10 years from under 8.9% in 2008 to more than 17.1% in 2017.” (p. 1)
- The 8.9% in 2008 was already more than double the 4% from 1983 (Chandra, et.al., 2010).
- Greater marijuana potency means a smaller amount can make someone higher, faster- and perhaps far more intoxicated than they can handle.





Potency of Seized Marijuana in the U.S.

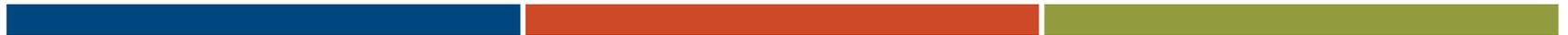


Source: University of Mississippi, National Center for Natural Products Research, *Potency Monitoring Project Quarterly Report 115* (December 2011)



In Summary

- The marijuana of today is much different than the marijuana of the 60's and 70's.
- There are many different routes of administration and many different forms available, all sold in dispensaries in legalized states.
- Different forms come with different health risks, including impacts to our brains, our heart, and our respiratory systems.
- The average potency of marijuana products is much higher than it was decades ago, this also comes with health risks.
- Education is extremely important, for parents, educators, employers, and many other sectors of our communities.





PTTC

Prevention Technology Transfer Center Network
Funded by Substance Abuse and Mental Health Services Administration

PTTC Resources

More prevention training and technical assistance resources, including more resources for marijuana prevention, available from SAMHSA's Prevention Technology Transfer Center Network
Visit: pttcnetwork.org to learn more.



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