

This is an official **CDC HEALTH ADVISORY**

Distributed via the CDC Health Alert Network
September 14, 2021, 10:00 AM ET
CDCHAN-00451

Increases in Availability of Cannabis Products Containing Delta-8 THC and Reported Cases of Adverse Events

Summary

The purpose of this Health Alert Network (HAN) Health Advisory is to alert public health departments, healthcare professionals, first responders, poison control centers, laboratories, and the public to the increased availability of cannabis products containing delta-8 tetrahydrocannabinol (THC) and the potential for adverse events due to insufficient labeling of products containing THC and cannabidiol (CBD).

Background

Marijuana, which can also be called weed, pot, or dope, refers to all parts of the plant *Cannabis sativa L.*, including flower, seeds, and extracts with more than 0.3% delta-9 tetrahydrocannabinol (THC) by dry weight. Any part of the cannabis plant containing 0.3% or less THC by dry weight is defined as hemp.¹ The cannabis plant contains more than 100 cannabinoids, including THC, which is psychoactive (i.e., impairing or mind-altering) and causes a “high”.² CBD is another active cannabinoid found in the cannabis plant that is not psychoactive and does not cause a “high”.

The term THC most often refers to the delta-9 THC isomer, which is the most prominently occurring THC isomer in cannabis. However, THC has several other isomers that occur in the cannabis plant, including delta-8 THC. Delta-8 THC exists naturally in the cannabis plant in only small quantities and is estimated to be about 50-75% as psychoactive as delta-9 THC.^{3,4}

CBD can be synthetically converted into delta-8 THC, as well as delta-9 THC and other THC isomers, with a solvent, acid, and heat to produce higher concentrations of delta-8 THC than those found naturally in the cannabis plant.⁵ This conversion process, used to produce some marketed products, may create harmful by-products that presently are not well-characterized.

Delta-8 THC products are increasingly appearing in both marijuana and hemp marketplaces, some of which operate legally under state, territorial, or tribal laws.⁶ Most states and territories permit full or restricted hemp marketplaces that sell hemp and hemp-derived CBD products.⁷ Products sold as concentrated delta-8 THC are also available online. Delta-8 THC products are sometimes marketed as “weed light” or “diet weed.”

The health effects of delta-8 THC have not yet been researched extensively and are not well-understood. However, delta-8 THC is psychoactive and may have similar risks of impairment as delta-9 THC.⁴ As such, products that contain delta-8 THC but are labeled with only delta-9 THC content rather than with total THC content likely underestimate the psychoactive potential of these products for consumers. In addition, the sale of delta-8 THC products is not limited to regulated marijuana dispensaries in states, territories, or tribal nations where marketplaces operate under law. Rather, delta-8 THC products are sold by a wide range of businesses that sell hemp. As a result, delta-8 THC products may also have the potential to be confused with hemp or CBD products that are not intoxicating. Consumers who use these products may therefore experience unexpected or increased THC intoxication.

A wide variety of delta-8 THC-containing products have entered the marketplace, including, but not limited to, vapes, smokable hemp sprayed with delta-8 THC extract, distillates, tinctures, gummies, chocolates, and infused beverages. In addition, because testing methods for products like synthetically derived delta-8 THC are still being developed, delta-8 THC products may not be tested systematically for contaminants such as heavy metals, solvents, or pesticides that may have adverse health effects.⁸

Recent increases in delta-8 THC-involved adverse events

In March 2021, the West Virginia Poison Control Center⁹ reported two cases of adverse events related to use of delta-8 THC products in adults. In both instances, individuals mistook the products containing delta-8 THC for CBD-like products. These exposures led to symptoms consistent with cannabis

intoxication. The Michigan Poison Control Center¹⁰ also reported two cases of severe adverse events to delta-8 THC in two children who ingested a parent's delta-8 THC-infused gummies purchased from a vape shop. Both children experienced deep sedation and slowed breathing with initial increased heart rate progressing to slowed heart rate and decreased blood pressure. The children were admitted to the intensive care unit for further monitoring and oxygen supplementation.

In 2021, The American Association of Poison Control Centers (AAPCC) introduced a product code specific to delta-8 THC into its National Poison Data System (NPDS), allowing for the monitoring of delta-8 THC adverse events*. From January 1 to July 31, 2021, 660 delta-8 THC exposures were recorded with the new product code, and one additional case was recorded as a delta-8 THC exposure from October 2020. Eighteen percent of exposures (119 of 661 cases) required hospitalization, and 39% (258 of 661 cases) involved pediatric patients less than 18 years of age.

Syndromic surveillance data from emergency departments participating in the CDC's National Syndromic Surveillance Program (NSSP) show an increase in visits with a mention of delta-8 THC or some variation in the chief complaint text in recent months. More than 4,400 active emergency facilities that represent portions of 49 states and Washington, DC contribute data to NSSP, accounting for approximately 71% of all U.S. non-federal emergency departments. The first suspected visit associated with delta-8 THC in NSSP was observed in September 2020, with three additional visits observed through the end of 2020. Suspected visits have generally increased monthly in 2021 (three suspected visits were observed in January; six in February; 16 in March; 11 in April; 29 in May; 32 in June; and 48 in July 2021). The majority of these visits (73%, 109 of 149 visits) occurred in the Department of Health and Human Services' Regions 4 and 6, which are composed primarily of Southern states that have not passed state laws to allow non-medical adult cannabis use.¹¹ These numbers are likely an underestimate due to the potential for inaccurate and incomplete information about products used by consumers.

Several factors can influence both the type and severity of cannabis-related adverse events, including the type of cannabinoid ingested, concentration, route of exposure, and the individual characteristics of the person who consumed the cannabinoid such as their age, weight, and sex. Delta-8 THC intoxication can cause adverse effects similar to those observed during delta-9 THC intoxication^{10,12}, and may include—

- Lethargy
- Uncoordinated movements and decreased psychomotor activity
- Slurred speech
- Increased heart rate progressing to slowed heart rate
- Low blood pressure
- Difficulty breathing
- Sedation
- Coma

Summary

The rise in delta-8 THC products in marijuana and hemp marketplaces has increased the availability of psychoactive cannabis products, even in states, territories, and tribal nations where non-medical adult cannabis use is not permitted under law. Variations in product content, manufacturing practices, labeling, and potential misunderstanding of the psychoactive properties of delta-8 THC may lead to unexpected effects among consumers. Adverse event reports involving products that contain delta-8 THC that resulted in consumers' hospital or emergency department treatment have been described. Increased reports of adverse events related to delta-8 THC, as well as preliminary reports of the emergence of other similarly produced products derived from cannabis warrant the continued monitoring and tracking of adverse events related to THC.

Recommendations for the Public and Consumers

- Consumers should be aware of possible limitations in the labeling of products containing THC and CBD even from approved marijuana and hemp retailers. Products reporting only delta-9 THC concentration, but not total THC may underestimate the psychoactive potential for consumers.
- Consumers should be aware that products labeled as hemp or CBD may contain delta-8 THC, and that products containing delta-8 THC can result in psychoactive effects. Delta-8 THC products are currently being sold in many states, territories, and tribal nations where non-medical adult cannabis use is not permitted by law. In addition, retailers may sell products outside of regulated dispensaries in states, territories, and tribal nations where cannabis use is permitted by law. This may provide consumers with a false sense of safety, as delta-8 THC products may be labeled as hemp or CBD, which consumers may not associate with psychoactive ingredients.

- Parents who consume edibles and other products that contain THC and CBD should store them safely away from children. Children may mistake some edibles that contain THC and CBD (e.g., fruit-flavored gummies containing delta-8 THC) as candy.
- If consumers experience adverse effects of THC- or CBD-containing products that are an immediate danger to their health, they should call their local or regional poison control center at 1-800-222-1222 or 911 or seek medical attention at their local emergency room and report the ingredients of ingested products to healthcare providers. Consumers are also encouraged to report adverse events to [MedWatch](#).
- Consumers should be aware that the cannabis marketplace continues to evolve. Other cannabis-derived products of potential concern have emerged recently, such as those containing delta-10 THC and THC-O acetate. More research is needed to understand the health effects of products containing these compounds.

Recommendations for Public Health Departments and Poison Control Centers, including those in locations where laws only permit hemp marketplaces

- Release information to healthcare providers and the public about the psychoactive qualities and the potential health implications of using products containing delta-8 THC and that products labeled as hemp or CBD may contain delta-8 THC.
- Poison control centers have a new code available to identify delta-8 THC exposures. For patients or providers reporting delta-8 THC consumption, poison control centers should use the American Association of Poison Control Centers code 310146 or product code 8297130 to indicate delta-8 THC exposure and aid in the continued surveillance of these exposures.
- States, territories, and tribal nations that have passed laws allowing non-medical use of adult cannabis or that may allow such use in the future may consider requiring the reporting of total THC content, including ingredients like delta-8 THC and other compounds that may be synthetically produced, on product labeling.
- Community-based organizations, such as Drug-Free Communities coalitions, can use information from this report to raise awareness in their communities about the potential negative health effects associated with use of delta-8 THC-containing products, as well as the emergence of other cannabis-derived products of potential concern.

Recommendations for Retailers Selling Cannabis Products

- Retailers selling cannabis products should provide information to consumers about the psychoactive qualities of delta-8 THC.
- Retailers selling cannabis products should report total THC content on product labeling, including ingredients like delta-8 THC that may be synthetically produced to create a psychoactive effect.

Recommendations for Healthcare Providers

- Healthcare providers should be vigilant in observing patients presenting with THC-like intoxication symptoms who do not report an exposure to marijuana or history of use. Symptomatic patients should be questioned about their use of CBD or delta-8 THC products.
- There is no specific antidote for THC intoxication. Treatment is largely symptomatic and supportive care. The ability to detect delta-8 THC with laboratory tests that hospitals use to detect delta-9 THC currently is not fully characterized. Consult with your hospital's medical toxicologist or local poison control center for toxicology consultations on treatment.

For More Information

- CDC Marijuana homepage: "[Marijuana and Public Health](#)"
- FDA Delta-8 THC Consumer Update: "[5 Things to Know about Delta-8 Tetrahydrocannabinol](#)"
- Visit [CDC-INFO](#) or call CDC-INFO at 1-800-232-4636
- CDC 24/7 Emergency Operations Center (EOC) 770-488-7100

References

1. [Agriculture Improvement Act of 2018](#). H.R.2, 115th Cong. (2017-2018).
2. Rosenberg EC, Tsien RW, Whalley BJ, Devinsky O. Cannabinoids and epilepsy. *Neurotherapeutics*, 12 (2015), pp. 747-768.
3. Razdan RK. CHEMISTRY AND STRUCTURE-ACTIVITY RELATIONSHIPS OF CANNABINOIDS: AN OVERVIEW, Editor(s): STIG AGURELL, WILLIAM L. DEWEY, ROBERT E. WILLETTE, *The Cannabinoids: Chemical, Pharmacologic, and Therapeutic Aspects*, Academic Press, 1984, Pages 63-78.
4. Hollister LE, Gillespie HK. Delta-8- and delta-9-tetrahydrocannabinol comparison in man by oral and intravenous administration. *Clin Pharmacol Ther.* 1973 May-Jun;14(3):353-7

5. Kiselak TD, Koerber R, Verbeck GF. Synthetic route of sourcing of illicit at home cannabidiol (CBD) isomerization to psychoactive cannabinoids using ion mobility-coupled-LC-MS/MS. *Forensic Sci Int* 2020; 308:110173.
6. Brightfield Group. [What's the Fate of Delta-8? Consumer, Product, and Regulatory Trends](#). Published 2021. Accessed August 31, 2021.
7. National Conference of State Legislatures (2020, April 16). [State Industrial Hemp Statutes](#).
8. Delta-8-THC, HB 3000, [2021 Oregon State Legislature Regular Session. Testimony of Steven Crowley](#).
9. West Virginia Substance Abuse Early Warning Network. Alert #WV003. Reported Cases of Adverse Reactions to Delta-8 THC Products in West Virginia. March 10, 2021.
10. Michigan Poison Center. [Fact Sheet: Emerging Public Health Concern: Delta-8 THC](#). April 23, 2021.
11. National Conference of State Legislatures (2021, July 14). [State Medical Marijuana Laws](#).
12. Grotenhermen F. Pharmacokinetics and pharmacodynamics of cannabinoids. *Clin Pharmacokinet*.2003;42(4):327-60.

** The American Association of Poison Control Centers (AAPCC) maintains the National Poison Data System (NPDS), which houses de-identified case records of self-reported information collected from callers during exposure management and poison information calls managed by the country's poison control centers (PCCs). NPDS data do not reflect the entire universe of exposures to a particular substance as additional exposures may go unreported to PCCs; accordingly, NPDS data should not be construed to represent the complete incidence of U.S. exposures to any substance(s). Exposures do not necessarily represent a poisoning or overdose and AAPCC is not able to completely verify the accuracy of every report. Findings based on NPDS data do not necessarily reflect the opinions of AAPCC.*

The Centers for Disease Control and Prevention (CDC) protects people's health and safety by preventing and controlling diseases and injuries; enhances health decisions by providing credible information on critical health issues; and promotes healthy living through strong partnerships with local, national, and international organizations.
