ToxTidbits

Maryland Poison Center
UNIVERSITY OF MARYLAND SCHOOL OF PHARMACY

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The Maryland Poison Center's Monthly Update: News, Advances, Information

Synthetic Cannabinoids Update 2025

Synthetic cannabinoids are a diverse group of more than 200 novel psychoactive substances (NPS) that bind to cannabinoid receptors. Typically, they bind much more strongly than Δ9-tetrahydrocannabinol (THC), and thus have more potent effects than THC. However, synthetic cannabinoids as a class are not predictable as trends in drug use and legal status promote the development of newer NPS (*Clin Toxicol (Phila). 2019;57(11):1103-1108*). Patient presentations may not fit nicely into one toxidrome; whether this is a feature of synthetic cannabinoids or related to polydrug overdose that includes synthetic cannabinoids is unclear.

The Center for Forensic Science Research & Education in the first quarter of 2025 reported that among synthetic cannabinoid samples and toxicologic specimens sent for testing, the most identified synthetic cannabinoids were 5F-MDMB-PINACA and MDMB-4en-PINACA (*2025 NPS Discovery Q1 2025 Trend Reports*). Synthetic cannabinoids were identified as adulterants in the 'legal opioid' tianeptine in New Jersey between June 2023-February 2024 (*J Med Toxicol. 2025;21(2):253-259*). In the United Kingdom, MDMB-4en-PINACA has been found as an adulterant in e-cigarette vaping devices (*Clin Toxicol (Phila). 2025;63(5):360-362*). Between 2023-2025 the Drug Enforcement Administration have made several arrests related to the smuggling of synthetic cannabinoids into the prison system (*https://www.dea.gov/what-we-do/news/press-releases*). Multiple items found within a county jail in Georgia were collected after 18 patients with suspected synthetic cannabinoid toxicity presented to a local hospital and were identified as containing MDMB-4en-PINACA between 2022-2023 (*JAMA Network Open. 2024;7(12):e2451951*).

Synthetic cannabinoids are not detectable with readily available immunoassays (drug screens). Avoiding detection may provide an incentive to use synthetic cannabinoids to avoid a positive result on an immunoassay urine toxicology screen. Detection within prison systems may be particularly difficult as NPS may be smuggled in as legal documents that have been treated with a liquid form of drug that can be taken orally or smoked; legal documents are not subject to the same searches as other mail which may facilitate entry into an otherwise controlled environment (*JAMA Network Open. 2024;7(12):e2451951*).

Clinical effects described vary widely and include agitation, CNS depression, delirium, psychosis, seizures, rhabdomyolysis, acute kidney injury, hypothermia, hyperthermia, bradycardia, hypotension, hypertension, tachycardia, myocardial infarction, and dysrhythmias. While there is a dearth of data to provide causal evidence, a review of fatalities associated with synthetic cannabinoids found that fatal outcomes were highest among males over 40 years, and underlying cardiovascular disease was prominent (*Clin Toxicol (Phila). 2020;58(5):368-374*).

Management of synthetic cannabinoid toxicity is supportive in nature with hemodynamic support that can include, but may not be limited to, intravenous fluids and vasopressors for hypotension, atropine or cardiac pacing for bradycardia, advanced cardiac life support measures for dysrhythmias, intubation and ventilation, and benzodiazepines for seizures or agitation. There is no specific antidote for synthetic cannabinoids available.

If synthetic cannabinoid toxicity is known or suspected, or for any other poisoning, call your local poison center at 1-800-222-1222.

Did you know?

"Pink Cocaine" got its nickname "tusi" from the synthetic cannabinoid 2-CB that used to be found in it for its hallucinogenic properties.

However, today, "pink cocaine" is more likely to contain other stimulants and hallucinogens like ketamine, MDMA, or methamphetamine than 2-CB or other synthetic cannabinoids.

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