

# Psychosis, Addiction, Chronic Vomiting: As Weed Becomes More Potent, Teens Are Getting Sick

With THC levels close to 100 percent, today's cannabis products are making some teenagers highly dependent and dangerously ill.



By Christina Caron

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Elysse was 14 when she first started vaping cannabis.

It didn't smell, which made it easy to hide from her parents. And it was convenient — just press a button and inhale. After the second or third try, she was hooked.

"It was insane. Insane euphoria," said Elysse, now 18, whose last name is being withheld to protect her privacy. "Everything was moving slowly. I got super hungry. Everything was hilarious."

But the euphoria eventually morphed into something more disturbing. Sometimes the marijuana would make Elysse feel more anxious, or sad. Another time she passed out in the shower, only to wake up half an hour later.

This was not your average weed. The oil and waxes she bought from dealers were typically about 90 percent THC, the psychoactive component in marijuana. But because these products were derived from cannabis, and nearly everyone she knew was using them, she assumed they were relatively safe. She began vaping multiple times per day. Her parents didn't find out until about one year later, in 2019.

"We got her in a program to help her with it. We tried tough love, we tried everything, to be honest with you," Elysse's father said of her addiction.

Starting in 2020 she began having mysterious bouts of illness where she would throw up over and over again. At first she and her parents — and even her doctors — were baffled. During one episode, Elysse said, she threw up in a mall bathroom for an hour. "I felt like my body was levitating."

Another time she estimated that she threw up at least 20 times in the span of two hours.

It wasn't until 2021, after a half dozen trips to the emergency room for stomach illness, including some hospital stays, that a gastroenterologist diagnosed her with cannabinoid hyperemesis syndrome, a condition that causes recurrent vomiting in heavy marijuana users.

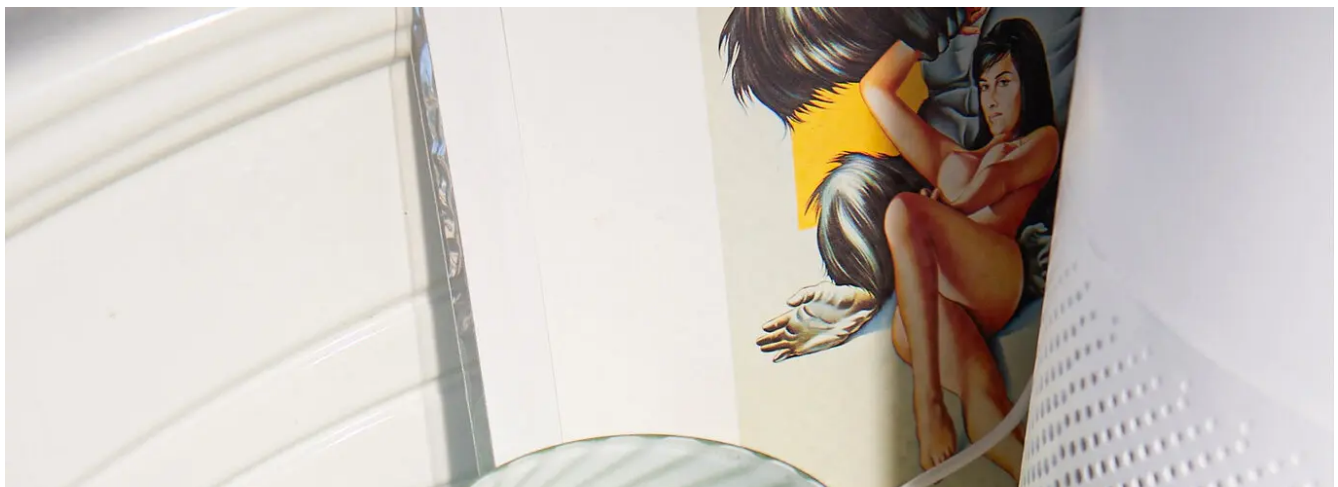
Although recreational cannabis is illegal in the United States for those under 21, it has become more accessible as many states have legalized it. But experts say today's high-THC cannabis products — vastly different than the joints smoked decades ago — are poisoning some heavy users, including teenagers.

Marijuana is not as dangerous as a drug like fentanyl, but it can have potentially harmful effects — especially for young people, whose brains are still developing. In addition to uncontrollable vomiting and addiction, adolescents who frequently use high doses of cannabis may also experience psychosis that could possibly lead to a lifelong psychiatric disorder, an increased likelihood of developing depression and suicidal ideation, changes in brain anatomy and connectivity and poor memory.

But despite these dangers, the potency of the products currently on the market is largely unregulated.

## 'I felt so trapped.'

In 1995, the average concentration of THC in cannabis samples seized by the Drug Enforcement Administration was about 4 percent. By 2017, it was 17 percent. And now cannabis manufacturers are extracting THC to make oils; edibles; wax; sugar-size crystals; and glass-like products called shatter that advertise high THC levels in some cases exceeding 95 percent.





Brightly colored vapes alongside a container of cannabis resin wax. In recent years, products like waxes — many containing more than 90 percent THC — have become increasingly popular. Michelle Groskopf for The New York Times





A liquid live resin in a girl's bedroom. Some concentrated cannabis products are designed to look like juice boxes to highlight their fruity flavors. Michelle Groskopf for The New York Times

Meanwhile, the average level of CBD — the nonintoxicating compound from the cannabis plant tied to relief from seizures, pain, anxiety and inflammation — has been on the decline in cannabis plants. Studies suggest that lower levels of CBD can potentially make cannabis more addictive.

THC concentrates “are as close to the cannabis plant as strawberries are to frosted strawberry pop tarts,” Beatriz Carlini, a research scientist at the University of Washington’s Addictions, Drug and Alcohol Institute, wrote in a report on the health risks of highly concentrated cannabis.

Although cannabis is legal for recreational use in 19 states and Washington, D.C., and for medical use in 37 states and D.C., only Vermont and Connecticut have imposed caps on THC concentration. Both ban concentrates above 60 percent, with the exception of pre-filled cartridges, and do not permit cannabis plant material to exceed 30 percent THC. But there is little evidence to suggest these specific levels are somehow safer.

“In general, we do not support arbitrary limits on potency as long as products are properly tested and labeled,” Bethany Moore, a spokeswoman for the National Cannabis Industry Association, said in a statement. She added that the best way to keep marijuana away from teens is to implement laws that allow the cannabis industry to replace illegal markets, which do not adhere to age restrictions, state-mandated testing or labeling guidelines.

The Food and Drug Administration has sent warnings about various cannabis products, including edibles, but so far federal regulators haven’t taken action to curb potency levels because cannabis is federally illegal, said Gillian Schauer, the executive director of the Cannabis Regulators Association, a nonpartisan nonprofit organization that convenes government officials involved in cannabis regulation across more than 40 states and territories.

California lawmakers are now considering adding a mental health warning label to cannabis products specifying that the drug may contribute to psychotic disorders.

National surveys suggest that marijuana use among 8th, 10th and 12th graders decreased in 2021, a change partly attributed to the pandemic. However, over the two-year interval from 2017 to 2019, the number of kids who reported vaping marijuana over the last 30 days rose among all grades, nearly tripling among high school seniors. In 2020, 35 percent of seniors, and as many as 44 percent of college students, reported using marijuana in the past year.

Elysse got sober before entering college but soon found that seemingly everyone on her dorm floor habitually used weed.

“Not only carts,” she said, referring to the cannabis cartridges used in vape pens, “but bongs, pipes, bowls — absolutely everything.” Each morning, she found students washing their bongs in the communal bathroom at 8 a.m. to prepare for their “morning smoke.”

After a few weeks, she began vaping concentrated THC again, she said, and also started having dark thoughts, occasionally sitting alone in her room and sobbing for hours.

“I felt so trapped,” said Elysse, who has now been clean for nearly two months. “This is not fun in any way anymore.”

### Teens are particularly affected by cannabis.

Michael McDonell, an addiction treatment expert at the Washington State University college of medicine, said that more research is needed to better understand how much more prevalent psychosis and cannabinoid hyperemesis syndrome have become among teenagers and others using high potency products.

Even so, he added, “we definitely know that there’s a dose-dependent relationship between THC and psychosis.”

One rigorous study found that the risk of having a psychotic disorder was five times higher among daily high potency cannabis users in Europe and Brazil than those who had never used it.



A couple with cannabis vape pens. In 2020, 35 percent of high school seniors, and as many as 44 percent of college students, reported using marijuana in the past year. Michelle Groskopf for The New York Times

Another study, published in 2021 in JAMA Psychiatry, reported that, in 1995, only 2 percent of schizophrenia diagnoses in Denmark were associated with marijuana use, but by 2010 that figure had risen to 6 to 8 percent, which researchers associated with increases in the use and potency of cannabis.

Cannabinoid hyperemesis syndrome, which can often be alleviated by hot baths and showers, is also linked to prolonged, high-dose cannabis use. As with psychosis, it’s unclear why some people develop it and others do not.

Dr. Sharon Levy, the director of the Adolescent Substance Use and Addiction Program at Boston Children's Hospital, said there is "no doubt that higher concentration products are increasing the number of people who have bad experiences with cannabis."

When her clinic opened in 2000, marijuana was illegal in Massachusetts. At the time, Dr. Levy said far fewer kids came in with psychotic symptoms "and we almost never saw cannabis hyperemesis syndrome."

Now, she said, those numbers are shooting up. Psychotic symptoms while high can include hallucinations, trouble distinguishing between fantasy and reality, strange behaviors (one young man would spend his days tying plastic bags into knots) or voices talking to them in their head, she added.

If a teenager displays these symptoms, getting that person off cannabis "becomes an emergency," she said. "Because maybe, just maybe they'll clear up, and we're preventing someone from developing a lifelong psychiatric disorder."

### 'Oh well, it's just weed.'

Laura Stack, who lives in Highlands Ranch, Colo., said that when her son Johnny first confessed to using marijuana at the age of 14, she said to herself, "Oh well, it's just weed. Thank God it wasn't cocaine."

She had used marijuana a couple of times in high school and cautioned him that marijuana would "eat your brain cells." But at the time she wasn't overly concerned: "I used it, I'm fine, what's the big deal?"

"But I had no idea," she added, referring to how marijuana has changed in recent years. "So many parents like me are completely ignorant."

Initially, her son did not have any mental health problems and excelled in school. But he eventually started using high potency marijuana products multiple times a day, and this, Ms. Stack said, "made him completely delusional."

By the time he reached college, he had been through various addiction treatment programs. He had become so paranoid that he thought the mob was after him and his college was a base for the F.B.I., Ms. Stack said. At one point, after he moved out of his childhood home, he threatened to kill the family dog unless his parents gave him money. His mother later discovered that Johnny had obtained his own medical marijuana card when he turned 18 and had begun dealing to younger kids.

After several stays at mental hospitals, the doctors determined that Johnny had a severe case of THC abuse, Ms. Stack said. He was prescribed an anti-psychotic medication, which helped — but then he stopped taking it. In 2019, Johnny died after jumping from a six-story building. He was 19. A few days before his death, Ms. Stack said, Johnny had apologized to her, saying that weed had ruined his mind and his life, adding, "I'm sorry, and I love you."

A recent study found that people who used marijuana had a greater likelihood of suicidal ideation, plan and attempt than those who did not use the drug at all. Ms. Stack now runs a nonprofit called Johnny's Ambassadors that educates communities about high-THC cannabis and its effect on the adolescent brain.

### There's 'no known safe limit.'

It can be difficult to pinpoint exactly how much THC enters someone's brain when they're using cannabis. That's because it's not just the frequency of use and THC concentration that affect dosage, it's also how fast the chemicals are delivered to the brain. In vaporizers, the speed of delivery can change depending on the base the THC is dissolved in, the strength of the device's battery and how warm the product becomes when it's heated up.

Higher doses of THC are more likely to produce anxiety, agitation, paranoia and psychosis.

"The younger you are, the more vulnerable your brain is to developing these problems," Dr. Levy said.

Youths are also more likely to become addicted when they start using marijuana before the age of 18, according to the Substance Abuse and Mental Health Services Administration.

Furthermore, there is growing evidence that cannabis can alter the brain during adolescence, a period when it is already undergoing structural changes. Until more is known, researchers and clinicians recommend postponing cannabis use until later in life.

"I have kids asking me all the time, 'What if I do this just once a month, is that OK?'" Dr. Levy said. "All I can tell them is that there's no known safe limit."

Dr. McDonnell agreed that avoiding drug use entirely is always the safest option, but said that some kids might require a more nuanced conversation. He advised having open discussions about drugs with middle-schoolers and teenagers, while also educating them about the dangers of high potency cannabis products compared to those that are mostly made of CBD.

"I think that's something we're all struggling with as a community," he added. "How do we get this information to parents and kids fast enough?"

Audio produced by Kate Winslett.