

Researchers warn of mental health risks of high-potency cannabis

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Researcher Beatriz Carlini clicks through a few local cannabis retailers' websites before finding what she's looking for.

Her screen displays a yellow goo, similar in appearance to raw honey, or as the product's marketing calls it, "Cake Batter."

The substance is a highly concentrated form of cannabis called a dab, which is produced by extracting the psychoactive compound THC from [cannabis plants](#). It's usually vaporized and inhaled using a device that looks similar to a bong, but often involves a blow torch.

Cake Batter is potent. Its label reads 65% THC.

But the product's THC concentration is "relatively low" in the vast and legal world of highly potent products, or dabs, says Carlini, acting associate professor at the Addictions, Drug and Alcohol Institute at the University of Washington School of Medicine. While a typical cannabis flower averages around 20% THC, some dabs sold in Washington contain as much as 90%.

Such products are setting off alarm bells for physicians and a group of research scientists in the Pacific Northwest, who see the wide availability of dabs and other highly concentrated substances as a quiet but growing threat to public health, especially among young adults and teenagers. Lawmakers are considering [new regulations](#), like a THC cap or higher tax on potent products. However, retailers and suppliers point out that these products are already illegal for those under 21. And they warn that bans or increasing taxes on certain products could spur the growth of an illegal market that would be significantly more difficult to monitor and control.

When cannabis was legalized for [recreational use](#) in Washington beginning in 2014, extracted cannabis, which includes concentrates, made up about 9% of the market. Concentrates now make up 35%, according to 2020 data from the Washington State Liquor and Cannabis Board.

"This is a case of product development trumping science and trumping policy," Carlini said. "Nobody was aware we were legalizing this."

Industry leaders dispute this, and say that a variety of products—including more potent ones—are part of the natural evolution of a market.

"Those products were envisioned," said Burl Bryson, executive director at the Seattle-based nonprofit The Cannabis Alliance. "In a mature market you're going to see an increased use of concentrates over flower."

Research on highly concentrated products—which are also referred to as wax, resin or shatter—is still limited in the U.S., primarily because the [federal government](#) strictly regulates cannabis research.

But scientists point to emerging evidence from studies in adults that link high-potency THC to an increased risk of experiencing psychosis—and a heightened risk of developing psychosis years earlier than would otherwise be expected in people at risk for the condition. Psychosis involves a loss of contact with reality, and symptoms can include delusions and hallucinations.

While it's unclear how high-potency THC affects youths, especially long term, a large body of research links frequent cannabis use in youths to psychotic symptoms. Anecdotally, pediatricians here report an increasing number of teenagers in emergency rooms with psychotic episodes, disorientation and severe vomiting, called cannabis hyperemesis syndrome.

Whether such products should be further regulated—and how to do so—raises complex questions for policymakers.

So far, only Vermont and Connecticut included caps on high THC

concentrations in their cannabis legalization bills—both at 60% THC. California is considering legislation requiring cannabis producers to include a label warning of potential mental health consequences and other risks.

If Washington moves to regulate THC concentrates, the state would become a testing ground for what happens when a state cracks down on the cannabis industry after legalization. In 2021, Carlini and a group of researchers received \$500,000 from lawmakers to study potential regulatory measures; their report was due to the Washington State Health Care Authority on Sept. 30 and is expected to be released publicly at the end of December.

"We would be the first state to do something after (the state) already created this open season," said Rep. Lauren Davis, D-Shoreline, who proposed two THC-cap bills that failed to get out of committee in recent legislative sessions; one bill suggested capping THC concentrates at 10%, the other suggested a 30% cap.

Davis, who describes the state's cannabis industry as a "failed experiment," said she intends to propose new legislation based on the researchers' findings.

'Time bomb'

Researchers face an uphill messaging battle: Historically, the U.S. government's 'Reefer Madness' misinformation campaign and the war on drugs sowed serious public doubt about anti-cannabis rhetoric.

But scientists warn that emerging data is worrisome.

A majority of teens in the Northwest don't use cannabis, but among those who do, they increasingly report use of dabs and other alternatives

to smoking. According to Washington's 2021 Healthy Youth Survey, about 33% of Washington 12th graders who use cannabis reported that they dabbled it. And in Oregon, the portion of youth who use cannabis and reported dabbling jumped from 26% to 36% from 2017-2019.

U.S. Poison Control Center data suggests cannabis-related calls are going up at a time when poison center calls are going down overall. When people called with cannabis-related concerns, they were more likely to call poison centers after using manufactured cannabis products such as dabs than after using plant-based cannabis.

"When we hear a signal coming through poison centers, I'm taking that very seriously because those signals are quieter than they used to be," said Julia Dilley, a UW epidemiologist, who presented the data at a September symposium that attracted more than 150 scientists and others.

Nearly everyone interviewed acknowledged that more research is needed on high-potency products and their link to mental health consequences in youth. There's an inherent lag in understanding the relationship, since the factors that contribute to serious mental illnesses are many and can compound over years.

Existing studies don't include results from people using the types of high-potency products available now: The bulk of the research is in products containing about 10% THC per U.S. government research rules, points out Denise Walker, a clinical psychologist and research professor at UW. And no studies prove a direct causal link between high-potency THC and psychosis, primarily because an experiment in people that tests a direct relationship would be unethical.

"This has been used by the industry as a reason to do nothing," Carlini said, but "everything we have in hand sciencewise, right now, is indicating this is a time bomb."

Pediatricians say they're already witnessing what happens when youth with little or no THC tolerance try extremely potent products. Some wind up having a psychotic episode or experiencing temporary cognitive impairment, like trouble with simple motor tasks, finding words or remembering something they were just told. Others who've built up a tolerance to high-THC products seek help after severe bouts of vomiting, dehydration and stomach pain, symptoms of CHS.

"Are people really seeing this or are we just blowing smoke here? I'm totally seeing it. I see it at least three or four times a week," said Dr. Cora Breuner, professor of pediatrics at UW and a physician at Seattle Children's hospital, noting she's referring more youth for cannabis use disorder than she did five years ago, but that demand is now outpacing available resources.

At a 2021 state legislative hearing on the issue, Dr. Beth Ebel said some youths are so high when they arrive at the ER that they appear to have a traumatic brain injury.

"Almost a third of the kids 12 and up that I take care of in the trauma center have cannabis involved in their injury," said Ebel, a pediatrician at Harborview.

What happens now?

The question of how to address concentrates comes down to whether state regulations would embolden a more dangerous black market. Policymakers are weighing several options, including raising age limits or marketing restrictions on high-potency products, charging higher taxes, adding THC caps and launching more robust public health awareness campaigns.

Industry and consumer experts vigorously campaigned against Davis'

THC cap proposals and continue to argue that new restrictions will lead to worse [public health](#) outcomes as unregulated products may contain pesticides or dangerous additives.

"(Our) top priority is a safe and quality-controlled marketplace that works to keep products away from kids," Vicki Christophersen, executive director and lobbyist for Washington CannaBusiness Association, which represents producers and retailers across the state, wrote to The Seattle Times. "A return to prohibition policies is a threat to an open, transparent sector and inadvertently supports the illicit market, which operates in the dark."

Ramsey Doudar, who works at a cannabis dispensary and leads a consumer advocacy group called Patients and Users for Reasonable Cannabis Policy, said retailers already enforce strict rules that keep people under 21 from purchasing cannabis.

"The next step is using some of that billion dollars of tax revenue (generated by the cannabis industry) to focus on education and prevention," he said. Adults should be held accountable when they give or sell cannabis to minors, he added.

Because this is new territory for policymakers, there's "enormous uncertainty" about the right approach, said Jonathan Caulkins, a professor at Carnegie Mellon University in Pittsburgh who's analyzed Washington's cannabis market in collaboration with the nonprofit RAND.

If the state decides to regulate, it should "start small, until we find out what kind of restrictions can be pulled off without creating an illegal market," he said. "And that's in part finding out whether or not the Washington state government has the backbone to enforce a prohibition."

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