

Juul disregarded early evidence it was hooking teens

 <https://www.reuters.com/investigates/special-report/juul-ecigarette/>

Juul executives knew young people were flocking to its breakthrough e-cigarette shortly after it went on sale in 2015, a former manager tells Reuters. Its nicotine blend was so potent, engineers devised a kill switch to limit the dosage – but the idea was shelved.

By [CHRIS KIRKHAM](#) | Filed Nov. 5, 2019, 11 a.m. GMT

The San Francisco startup that invented the groundbreaking Juul e-cigarette had a central goal during its development: captivating users with the first hit.

The company had concluded that consumers had largely rejected earlier e-cigarettes, former employees told Reuters, because the devices either failed to deliver enough nicotine or delivered it with a harsh taste. Developers of the Juul tackled both problems with a strategy they found scouring old tobacco-company research and patents: adding organic acids to nicotine, which allowed for a unique combination of smooth taste and a potent dose.

Employees tested new liquid-nicotine formulations on themselves or on strangers taking smoke breaks on the street. Sometimes, the mix packed too much punch – enough nicotine to make some testers' hands shake or send them to the bathroom to vomit, a former company manager told Reuters.

In the end, it worked. The formula delivered nicotine to the bloodstream so efficiently, in fact, that the company's engineers explored features to stop users from ingesting too much of the drug, too quickly. Juul's founders applied for a patent in 2014 that described methods for alerting the user or disabling the device when the dose of a drug such as nicotine exceeds a certain threshold.

One idea was to shut down the device for a half-hour or more after a certain number of puffs, said Chenyue Xing, a former Juul scientist who helped patent its liquid-nicotine formula. The concern stemmed in part from the fact that a Juul – unlike a cigarette – never burns out, Xing said in an interview.

“You hope that they get what they want, and they stop,” she said. “We didn't want to introduce a new product with a stronger addictive power.”

The company never produced an e-cigarette that limited nicotine intake. Xing was not directly involved in the engineering of the device and said she didn't know why the firm did not adopt a dosage-control feature.

Juul Labs Inc is now the central player in a broader controversy sweeping the United States over the safety of its products along with those of a wave of high-nicotine imitators. The rise of Juul sales tracks closely with an epidemic of teenage nicotine use that has brought a hail of criticism and regulatory scrutiny on the company.

Congressional investigators, state attorneys general and health advocates have so far focused on whether Juul targeted young people through its marketing and the dessert-like flavors of some Juul nicotine liquids, such as creme brulee or mango. But a Reuters investigation has found that, from the company's earliest days, insiders discussed and debated concerns over more fundamental attributes of the product: its potency and addictiveness.

The breakthrough "nicotine salts" formula that made the Juul e-cigarette so addictive – and ignited the company's explosive market-share growth – made Juul especially attractive to teenagers and other new users who otherwise would never have smoked cigarettes, according to interviews with more than a dozen tobacco researchers, pediatricians, and a Reuters review of Juul patents and independent research on nicotine chemistry. The device delivers the drug more efficiently than a cigarette, according to emerging academic research into Juul's formula and the company's own patent documents.

In written answers to questions from Reuters, Juul said that it never intended to attract underage customers. The company acknowledged it needed to "earn back the trust of regulators, policymakers, key stakeholders and society at large" in light of a surge in youth vaping to "unacceptable" levels.

Juul declined to comment on why it never installed the features it considered to limit nicotine intake. It said it designed its products to mimic the experience of cigarettes because that was key to getting smokers to buy them. Citing studies it commissioned, the company said Juul users have far more success in quitting smoking than those who tried earlier e-cigarettes.

The firm seldom mentioned nicotine in early consumer marketing, which featured young, hip models and sold the product as a stylish alternative to cigarettes. But the company's sales force – tasked with convincing reluctant retailers to give Juul shelf space – emphasized the device's unique addictive power by showing store owners charts depicting how the Juul device delivers nicotine to the bloodstream as efficiently as a traditional cigarette, said Vincent Latronica, who headed sales and distribution for the company on the U.S. East Coast from 2014 until early 2016. That argument became a central selling point, Latronica said, allowing the young company to overcome retailer skepticism of early e-cigarettes and to break into sales channels long dominated by tobacco companies.

"Everyone wanted it," Latronica said.

Juul did not answer questions from Reuters on why the company emphasized the addictive qualities of its product to retailers and downplayed them in advertisements to customers.

Flavors drive e-cigarette use among high schoolers

High school students like fruit, mint and candy flavors of e-cigarette nicotine liquids far more than tobacco flavors, survey data shows. Regulators have pressured Juul and other vaping device makers to stop offering flavors that appeal to children.

Inside the company, the first signs that Juul had a strong appeal to young people came almost immediately after the sleek device went on sale in 2015, according to the former company manager, who spoke on condition of anonymity. Employees started fielding calls from teenagers asking where they could buy more Juuls, along with the cartridge-like disposable "pods" that contain the liquid nicotine.

The calls and other early signs of teenage use kicked off an internal debate, the manager said in an interview. Some company leaders, including founder James Monsees, argued for immediate action to curb youth sales. Monsees served as chief executive and a company director at the time. The counter-argument came from other company directors, including healthcare entrepreneur Hoyoung Huh and other early investors, the former manager said. They argued the company couldn't be blamed for youth nicotine addiction because it did not intentionally advertise or sell to teens, said the manager, who had direct knowledge of the internal discussions.

"Clearly, people internally had an issue with it," the manager said, referring to sales of Juuls to teenagers. "But a lot of people had no problem with 500 percent year-over-year growth."

Company leaders also clearly understood the long-term benefit of young users on its bottom line, the manager said. It was well-known that young customers were "the most profitable segment in the history of the tobacco industry" because research shows that nicotine users who start as teenagers are the most likely to become lifelong addicts.

In its written answers to Reuters, Juul said that Monsees "did not recall" the internal debate in 2015 over whether to take action to stop youth sales. Huh and other board members who served at the time of the company's product launch did not respond to requests for comment. Board member Harold Handelsman declined to comment, citing pending lawsuits against the company.

Juul declined to make Monsees or company co-founder Adam Bowen available for interviews.

Following the product's launch, it took nearly three years – and pressure from regulators and U.S. senators – before Juul in April 2018 announced what it called a "comprehensive strategy" of measures to curb youth sales. By that time, a leading U.S. government youth tobacco survey showed that more than 3 million U.S. high school students – one in five – had tried an e-cigarette in the prior month. More than a quarter of those vaped at least 20 days a month. The latest available data from the same survey, in September 2019, shows yet another increase: More than one in four high schoolers – 27.5% – reported using e-cigarettes in the previous month.

The measures to prevent youth sales and use came two days after the U.S. Food and Drug Administration (FDA) announced a nationwide crackdown on underage sales of Juul products. The company committed \$30 million for youth prevention efforts, including distributing educational materials to retailers and conducting research into technologies to prevent youth sales.

Asked why the company did not act sooner, Juul noted two measures to curb youth sales that it took half a year earlier, in August and September of 2017: raising the minimum age for online purchases through Juul's website to 21 even though some states allow retail sales to anyone over 18, and starting a "retail monitoring program." The company repeated that it now needs to earn back the public's trust and said the firm "reacted to the information that it had, and increased its youth prevention measures as more data came out over the years."

The former manager's account of the early debate over young users contradicts repeated statements from executives that the firm was caught off-guard by teenage addiction beginning last year – "completely surprised," as Chief Administrative Officer Ashley Gould put it in a CNN interview.

That narrative is further undermined by two prominent tobacco researchers who told Reuters that they explicitly warned Juul's founders and a top company scientist about the potential for youth e-cigarette abuse. Neal Benowitz at University of California-San Francisco, said he told Gal Cohen, the company's director of scientific affairs, that widespread teen use could wreck the company's business.

"Look, the one thing you have to do is make sure that this doesn't get into the hands of young people," Benowitz recalled telling Cohen about a year after the product launch. "If it spreads among kids, this product could be dead."

Juul declined to comment on whether tobacco researchers warned company leaders about youth e-cigarette addiction. Cohen and Gould did not respond to requests for comment.

This inside account of Juul's early inaction on youth addiction comes as the company faces mounting pressure from regulators. CEO Kevin Burns departed in September after a dizzying series of bad headlines for Juul and the industry: an outbreak of mysterious lung illnesses tied to vaping; an FDA warning about the company's unauthorized health claims; and a proposed Trump administration ban on all e-cigarette flavors except those mimicking natural tobacco. Juul last month voluntarily halted online sales of flavors such as mango and fruit in the United States after earlier pulling them from retail stores. The company still sells the controversial flavors in many other markets globally.

The firestorm around Juul also led to the abandonment of merger talks between Philip Morris International Inc and Altria Group Inc, which has a 35% stake in Juul after a \$12.8 billion investment last year. Altria last week had to write down that investment by \$4.5 billion, citing the regulatory risks.

Altria declined to comment for this story, noting that it purchased its stake about a year ago, well after Juul developed its products.

Several state attorneys general and a U.S. congressional oversight committee are also investigating whether Juul marketed its products to underage users. Monsees and other company leaders have said they regret some of the company's early marketing but maintain it targeted customers in their mid-20s to early 30s.

As youth e-cigarette use continues to rise – after a long decline in teenage cigarette smoking – doctors, scientists and researchers are grappling with how to treat nicotine addiction among teenagers. Emerging research suggests serious risks to the developing adolescent brain.

The combination of a "very, very addictive" product and a developing brain has dangerous implications, said Bonnie Halpern-Felsher, a professor of pediatrics at Stanford University's medical school. "Rather than your brain getting pleasure from exercising or relationships, your brain becomes rewired to get pleasure from nicotine," she said.

Juul did not comment on the research into how e-cigarettes harm teenagers. It said it has launched a "robust scientific program to assess the harm-reduction potential of Juul products, including their impact on the individual user" as part of a larger effort to comply with FDA regulations.

For William Smith, a high school senior in Newburyport, Mass., Juul became an obsession that occupied most of his waking hours, leading to near-failing grades and wild mood swings. He first tried it in the summer of 2017 while playing video games at a friend's house and soon couldn't shake the craving. A year later, he was vaping a pod or more every day – an amount of nicotine equivalent to a pack of 20 cigarettes.

“It honestly controlled me,” Smith said. “It’s almost like I was going insane.”

Tapping cigarette industry research

One late night in 2004, company founders Monsees and Bowen were brainstorming for their master’s thesis in product design at Stanford University. They went to smoke cigarettes outside the design school studio, as they often did, and started questioning how such a successful yet low-tech consumer product - a burning stick of plant material - could have changed so little over time, according to the origin story the founders have told in speeches, interviews and promotional videos.

There must be a better, less harmful way to smoke, they figured, so they focused their thesis on creating a new kind of cigarette. Monsees and Bowen went on to start the company Ploom Inc, which was renamed Pax Labs Inc and later became Juul Labs Inc.

The Bay Area is a hotbed of tobacco-industry research, both at Stanford and the University of California-San Francisco. UCSF houses a trove of internal tobacco-industry documents made public as part of a 1998 settlement between the largest U.S. cigarette manufacturers and 46 state attorneys general.

Public health advocates and researchers called the mandated release of millions of formerly secret tobacco-industry documents among the most impactful public-service legacies of the settlement. The records unmasked the companies’ marketing tactics and informed research globally into the dangers of cigarettes. They are credited with laying the groundwork for the first global treaty on tobacco regulation.

Juul’s creators found another use for the records: product development.

Monsees and Bowen started digging into those documents for their thesis research, an endeavor that would continue over the next decade as they drew on knowledge from R.J. Reynolds Tobacco Co and others who had spent decades and billions of dollars searching for the optimal balance of flavor and addictive power.

During their thesis presentation in 2005, Monsees and Bowen showed a familiarity with research into “safer” cigarettes that tobacco companies had tried, with little success, to develop and sell in the 1980s. Those efforts, however, gave Juul a critical base of research.

“We had so much information that you wouldn’t normally be able to get in most industries,” Monsees said during a 2015 interview with entertainment website Social Underground. That allowed the company, he said, to catch up to a “huge, huge industry in no time.”

They also visited experts in the history of cigarettes and addiction, seeking endorsements for their early concepts. One of them, UCSF’s Stanton Glantz, wrote a book drawing extensively on the tobacco documents made public after the 1998 settlement.

Glantz recalled a meeting about a decade ago at which Bowen and Monsees told him they aimed to fight back against “the tobacco epidemic.” He said he warned them that e-cigarette popularity among young people was a big risk, citing the long history of teen addiction to cigarettes.

“What they told me was they didn’t think that was a problem,” Glantz said, “because they weren’t designing this as a product for kids.”

Juul's evolution

Juul's predecessor companies, Ploom Inc and Pax Labs, released several vaping devices before the Juul e-cigarette.

Juul declined to comment on whether Glantz and other researchers warned the company about the danger of addicting teenagers.

In 2010, Monsees and Bowen started selling their first vaping device, the Ploom. It was shaped like a pen and at first used butane to heat metal cylinders filled with tobacco.

It wasn't particularly effective at delivering nicotine, said Kurt Sonderegger, one of the first marketing employees at the fledgling company. But it drew interest from Japan Tobacco International, one of the world's largest cigarette makers, which made an early investment.

In 2012, the founders introduced a line of vaporizers called Pax. They were designed to heat up loose-leaf tobacco but instead became enormously popular as discreet devices for using cannabis. Sleek and fashionable, the Pax products were a hit, but were also expensive, running \$200 or more.

Pax's popularity with pot smokers helped put the company on the map with consumers, retailers and investors while it continued working on the larger goal of competing with tobacco cigarettes. Pax became "really a play to make money in the shorter term, to fuel their next ambitions" with what would become the Juul device, the former manager said. Latronica, the East Coast sales chief, recalled: "We always knew we had this game-changer in the background."

Focus on the first hit

Monsees and Bowen continued to mine the tobacco industry documents in the years leading up to Juul's 2015 launch. At the time, e-cigarettes had been available in the U.S. market for a few years but hadn't gained much traction. They used a type of liquid nicotine then sold by wholesalers called freebase nicotine, which had a caustic taste if used at concentrations high enough to mimic a cigarette.

The founders hired engineers and scientists drawn from places including Stanford and pharmaceutical companies. Among them was Xing, a research scientist who had previously worked to develop inhalable drugs for conditions such as asthma and migraine headaches. She was intrigued by the opportunity to take a product quickly to market, avoiding years-long regulatory drug-approval processes.

When she joined in 2013, Xing said, Bowen and others at the company were experimenting with the chemical properties of nicotine. They drew on tobacco research from companies such as R.J. Reynolds, which had experimented with nicotine's chemistry in the 1980s to create a smoother "light" cigarette with less tar, Xing said. Tar is a chemical substance left behind by burning tobacco, and it contains most of the carcinogenic compounds in cigarette smoke.

"We had consultants who were veterans of the big tobacco companies," said Xing, who recalled poring over tobacco company records and research. "We learned all the history."

Xing and others started to research the smoother type of nicotine that naturally occurred in the tobacco plant, known as “nicotine salts” or “protonated nicotine.” This form of the drug was highlighted in a cache of documents from R.J. Reynolds in the 1980s as part of an experiment called “Project XGT.”

R.J. Reynolds aimed to make the nicotine in low-tar “light” cigarettes more palatable to smokers. The company showed that adding organic acids to cigarettes could neutralize nicotine’s bitter taste by reducing its pH, or acid-base scale, while also delivering more nicotine. The addition would please customers wanting “a cigarette that is smooth, mild, highest quality, and very refreshing,” according to the R.J. Reynolds documents. The records do not make clear whether or how the company used the research in its cigarettes.

The use of acids to reduce harshness was “a key,” Xing said. “It was an avenue we could try to go down.”

When Juul’s predecessor company in 2014 filed patent documents describing its nicotine salts formula, it referenced the R.J. Reynolds patent on using acids as a cigarette additive.

Xing and others tested different kinds of acids to create a nicotine liquid with the optimal blend of smoothness and potency. They ultimately settled on benzoic acid after a series of blind trials.

Juul, in its statement to Reuters, said that the development of its nicotine salts formula “did not directly stem from a review of tobacco industry documents.”

The company acknowledged it consulted R.J. Reynolds research, along with a “variety of published sources,” but said it discovered through its own experimentation that adding organic acids to liquid nicotine resulted in more efficient delivery of the drug.

Xing said the goal was to provide “a similar level of kick and satisfaction” as a cigarette. Blending benzoic acid, a common food preservative, into e-cigarette nicotine liquids provided another advantage: a more direct path to the lungs, in which the stimulant is then propelled to the brain through the bloodstream. The freebase nicotine in earlier e-cigarettes was more easily absorbed in a user’s mouth and throat, a much slower path to the brain, nicotine researchers have found. That means the freebase formulation “never delivers the head buzz or kick,” Xing said.

The company’s goal was to deliver instant satisfaction to skeptical users, said the former manager. Surveys at the time showed that more than half of cigarette smokers had tried e-cigarettes but less than 10% became regular users.

That’s why the first hit was so crucial, the former manager said.

“We knew there might be a second or third draw, but not necessarily,” the person said.

Xing left Pax Labs in 2016 and has since started her own e-cigarette company in China called Myst Labs. She said she was surprised at how many teenagers gravitated toward Juul. She said her new company takes care to avoid appealing to young people and welcomes tougher regulations to prevent youth sales.

“We are targeting mature male users,” she said. “We didn’t want to get into similar trouble with the teenagers.”

“We had consultants who were veterans of the big tobacco companies,” said Chenyue Xing, a former Juul scientist who recalled poring over tobacco company records and research. “We learned all the history.”

Pitching addiction to retailers

In the leadup to Juul’s launch, the breakthrough nicotine blend was crucial to convincing distributors and convenience stores to carry their products. Many large retail chains had been burned by earlier e-cigarettes, which sat unsold on shelves.

“It was very, very difficult to get into doors with e-cigarettes, because a lot of these e-cigarettes were inferior products,” said Latronica, the former East Coast sales chief. The retailers, he said, “were sitting on thousands and thousands of dollars of product.”

Latronica said he started showing owners of vape shops and bodegas in New York City the chart comparing Juul to cigarettes as a way to assure them of repeat business. The chart plotted a line resembling a hockey stick, showing a rapid boost of nicotine to the bloodstream in less than five minutes.

Juul’s nicotine rush

A chart filed with the patent on Juul’s nicotine liquid shows how the formula delivers much more nicotine than earlier vaping devices – and more than a Pall Mall cigarette.

Juul’s patent contains a chart showing how its nicotine salts formula can deliver more nicotine to the bloodstream than a Pall Mall cigarette. In its statement to Reuters, Juul now says its product delivers slightly less nicotine than a cigarette.

To reassure retailers after the 2015 product launch, Juul offered to buy back any unsold devices, Latronica said. It also pitched retailers on profit margins of 36% on Juul pods, the cartridges of nicotine juice it makes, he said, more than three times what stores were netting on cigarettes. Juul pods also carried taxes that were \$3.50 less than the levy on comparable cigarette products, making them generally more affordable, according to a document produced by a Juul investor.

“We were relentless,” Latronica said of the sales teams’ efforts to reach out to every possible retailer.

A pack of four Juul pods costs about \$16, with each pod carrying the nicotine equivalent of a pack of 20 cigarettes. The price of a pack of cigarettes in most states is between \$6 and \$9, but more than \$11 in states such as New York and Illinois.

The pressure to ramp up sales got more intense when the company announced a major investment right after the product launch, according to another former manager at Juul’s predecessor company.

The company announced a \$46.7 million funding round that included investments from stalwarts like Fidelity Investments and Tao Capital Partners, a fund run by former Hyatt hotels chain executive Nicholas Pritzker,

who served on the e-cigarette startup's board of directors and remains in that role today. That investment round came in far higher than the amount anticipated by the company, the former manager said, creating immense pressure for swift growth.

Adding more pressure, Juul's first year was plagued by production backlogs. Former sales employees recalled the company often couldn't keep up with orders because of faulty devices or leaking nicotine pods.

Early advertising around Juul featured fluorescent colors and young models. Customers were urged to "share a #Juulmoment" and revel in its iPhone-like design with mottos such as "Simple. Smart. Satisfying."

The early advertising and social media campaigns eventually spawned an avalanche of user-generated content on Instagram and Twitter, with young people posting photos of themselves using the devices, often under hashtags such as #doit4juul or #juullife. Some teenagers posted YouTube videos of themselves reviewing the device or its pod flavors or performing stunts such as smoking multiple Juuls at once.

After regulators cracked down on the company in April 2018, Juul asked social media networks to take down any content promoting youth use of its products. Last fall, the company ended its own social media marketing efforts.

The models in Juul ads keep getting older

More nicotine than a Marlboro

In 15 puffs, a Juul emits about 15% more nicotine than a Marlboro Red cigarette, according to research from the American University of Beirut. Researchers at Portland State University will soon release research into the chemistry of Juul's nicotine blend that finds it is an almost exact match for the addictiveness and ease of inhalation found in a Marlboro, James F. Pankow, a chemistry and engineering professor at the school, told Reuters.

The Portland State researchers found that Juul's addition of benzoic acid smoothed out the harshness common in earlier e-cigarettes while retaining the "kick" that smokers loved in a Marlboro. The researchers noted that Juul had rapidly duplicated - and improved - a formula that it took tobacco growers and purveyors centuries to perfect.

"If you think Marlboros are bad because they're addictive, then this is like a Marlboro on steroids," said Pankow, who has long studied the chemistry of nicotine and tobacco smoke. "You're taking away the smell; you're putting it in a more discreet and sexy package; you're not lighting it on fire. It has all of the positive points and it takes away a lot of the negative points."

Cigarettes also deliver nicotine efficiently to the lungs, the most direct path to the brain, research shows. But some of the smoke is absorbed into the mouth and throat, giving users a so-called throat hit that's pleasurable but also harsh enough to slow the intake of smoke and nicotine. Unlike a cigarette, a Juul delivers "high doses of nicotine without it hurting the mouth and throat" at the moment when a user inhales, said Ted Wagener, a tobacco researcher at Ohio State University.

Juul's patent documents highlight that its nicotine aerosol "is more readily delivered to the user's lung," as opposed to the mouth or throat, where nicotine would absorb more slowly, with a "less satisfying effect."

Your brain on Juul

Addiction can set in quickly among young vapers. Susanne Tanski, a pediatrician and former chair of the tobacco consortium at the American Academy of Pediatrics, said she and colleagues are observing first-time Juul users becoming addicted within two months, compared to two years or more for a smoker to become dependent on cigarettes.

Young Juulers may also be taking in more nicotine than young smokers, according to a study last year by scientists at the Roswell Park Comprehensive Cancer Center and Stony Brook University in New York. They found that the levels of a nicotine indicator in the urine of young regular users of Juul or similar e-cigarettes was nearly 60% higher than that of regular cigarette smokers of the same age.

Researchers at Harvard Medical School and Massachusetts General Hospital surveyed more than 1,600 high school students in the Boston area and found that 58% of those who had ever tried Juul or similar high-nicotine devices continued to use them, compared to just 17% of teenagers who had ever tried cigarettes.

“The person who is becoming addicted to cigarettes has to be more determined; they almost have to want to become a smoker,” said Dr. Jonathan Winickoff, a pediatrician at MassGeneral Hospital for Children in Boston, who was involved in the survey. “With Juul, you get trapped much more easily. There’s nothing about it that’s telling your body that it’s harmful.”

There’s a surprising lack of long-term research on nicotine’s health effects, mostly because other toxins in cigarettes, which cause cancer, have always been the primary concern. But emerging studies suggest serious harmful effects on the developing brains of teenagers.

Throughout childhood and into the mid-20s, the human brain is in constant flux, forming new neural pathways that govern how people learn, control impulses and form emotions. Early exposure to nicotine hijacks that process, studies suggest, training the young mind to fixate on acquiring nicotine instead of forming connections that control mood disorders and impulsive behavior. This interruption has a particular impact on parts of the brain that control risk-taking, one reason why nicotine addiction is correlated with later use of drugs such as cocaine.

Beyond nicotine, other compounds in e-cigarette aerosols have been shown to increase the risk of heart attacks and lung disorders. There’s little long-term clinical research on exposure to e-cigarettes, however, because the products are so new. That research gap has frustrated efforts to pinpoint a root cause of more than 1,800 cases of severe lung illnesses tied to vaping in recent months in the United States.

E-cigarette enthusiasts and some researchers point to studies showing far fewer carcinogenic compounds in e-cigarettes than traditional cigarettes, which result in preventable fatal diseases in up to half of all lifetime users, according to the World Health Organization. The U.K. Royal College of Physicians, for example, has concluded that e-cigarettes are 95% less harmful than traditional cigarettes, citing a reduction in the risk of serious disease and death.

For Smith, the Massachusetts high school senior, a hit of a Juul was at first “relaxing and soothing” – until it wasn’t. Last school year, he often took multiple bathroom breaks during class to sneak vape hits.

“The second you’re done hitting it, you want to use it again,” he said.

Taking tests and completing homework became difficult because the urge for a Juul hit interfered with his focus, he said. His grades slipped: He nearly failed his second year of algebra after earning an “A” the year before.

William’s father, Christopher Smith, said it seemed like “no time at all” between first finding his son’s nicotine stash and the family’s decision to seek help.

Since March, Smith has been seeing Winickoff, the Mass General pediatrician, in an attempt to shake his Juul habit. He’s planning to take off a year between high school and college, in part to restore his ability to concentrate.

“It’s hard to sum up,” he said. “It’s something that’s made my life worse, made my life terrible. I wish I had never started it.”

Smith wears a prescription nicotine patch 24 hours a day and carries nicotine gum as a supplement.

And he still sometimes hits a Juul: “Occasionally, I do give in.”

Nicoteen Inc

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