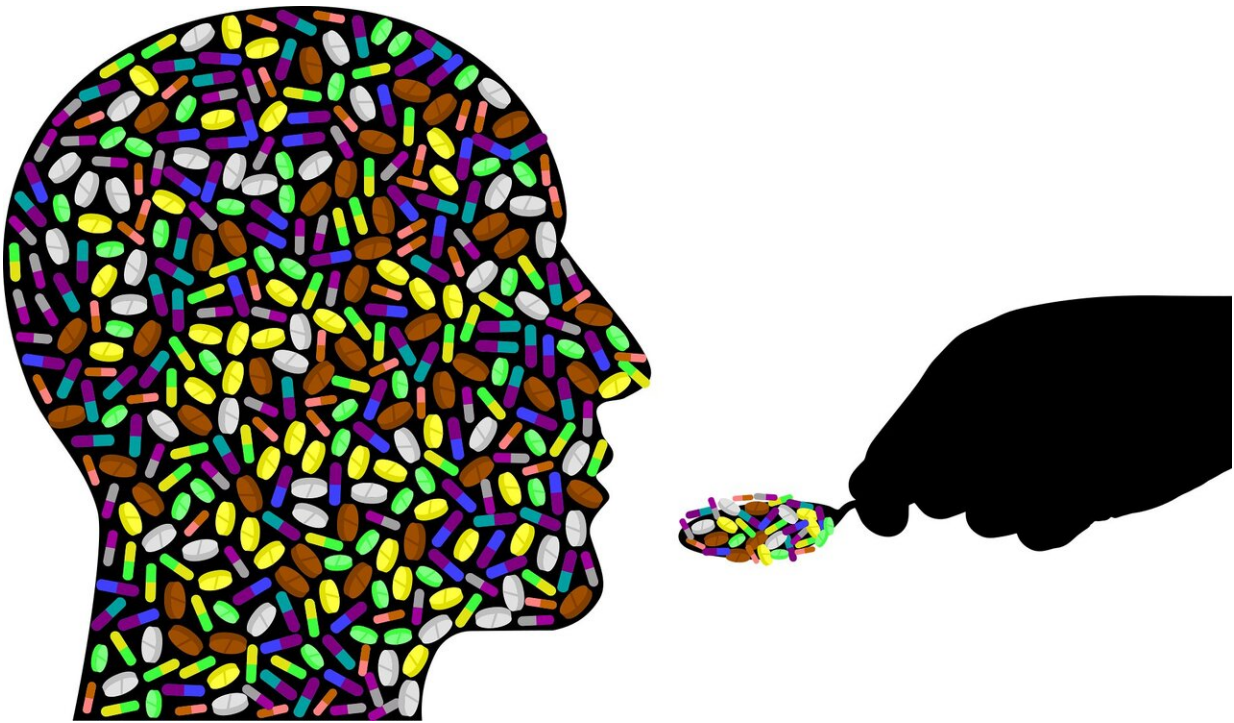


# Creating a safer fentanyl. How researchers are making the deadly drug less addictive

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A group of scientists say they've created a safer version of fentanyl that could potentially diminish the drug's addictive side effects, which have resulted in annual deaths of tens of thousands of people across the United States.

Fentanyl is a powerful synthetic opioid that is prescribed to treat patients with [severe pain](#) though it's also sold illegally and mixed with other drugs, including cocaine and heroin, making it more deadly. It's Exhibit A in the country's decades-long opioid crisis.

## **What is 'fourth wave' of the U.S. opioid crisis?**

The crisis, which began with [prescription opioids](#) in the 1990s and resulted last year in a nearly \$6 billion U.S. Justice Department settlement with Purdue Pharma and its owners, the Sackler family, for their deceptive practices in selling OxyContin, is now in its "fourth wave." In this stage, fentanyl is mixed with other drugs, often without buyers knowing it.

The lacing of fentanyl with deadly drugs like heroin is leading to a rise in stimulant-related overdoses, according to Melissa Ward, an assistant professor in the epidemiology department at Florida International University's Robert Stempel College of Public Health & Social Work.

## **More powerful than heroin**

Fentanyl is up to 50 times stronger than heroin, 100 times stronger than morphine and is one of the most common drugs involved in [overdose deaths](#). In 2021, more than 107,000 people in the U.S. died from a [drug overdose](#). About 71,450 of the deaths (66.5%) involved synthetic opioids, primarily illegally made fentanyl or fentanyl analogs, which are altered versions of the original drug, according to the U.S. Centers for Disease Control and Prevention.

And while prescribed fentanyl can still be misused and abused, most recent U.S. cases of fentanyl-related harm, overdose and death are linked to illegally made fentanyl, according to the CDC.

At the Miami Recovery Project, the mission is to help people on their road to recovery through a variety of free and confidential services, including [peer support](#), overdose prevention training and Narcan distribution. Narcan, the brand name for naloxone, is a prescription medicine used to reverse or reduce the effects of opioids.

"We're starting to see individuals that come in ... and those individuals are reporting that they prefer not to try and get heroin, OxyContin, Percodan or anything like that. They strictly want to utilize fentanyl. That's all they're looking for, which carries an extreme, extreme danger because the mortality risk is extremely high," said Brian Sims, the executive director of the Miami Recovery Project.

The group's mission is to ensure that people stay alive to give them a chance to recover, whether they became addicted to an opioid by prescription or from buying it on the street, Sims said.

## **Creating a safer fentanyl**

Altering fentanyl to lessen its dangerous side effects for patients who need its pain-reducing abilities could help slow the drug's addiction. To make this possible, a team of researchers from the University of Florida, Washington University in St. Louis, the University of Southern California and Stanford University worked together to get a better understanding of how the body's opioid receptors work.

Fentanyl binds really well to mu-opioid receptors, which are areas in the brain that control pain and emotion, and trigger a variety of responses, including pain relief and addiction.

Once the team identified a "molecular switch" inside the receptors, they began working on chemically modifying the drug to create an alternate fentanyl that would maintain its pain-killing effects while reducing the

risk of harmful side effects, including [respiratory distress](#) (trouble breathing), sedation, addiction and death, said Jay McLaughlin, one of the study's co-authors and a professor of pharmacodynamics in the University of Florida's College of Pharmacy, which is part of UF Health. Shainnel Eans, another UF researcher with the College of Pharmacy, also worked on the study.

The altered drug, which was tested on mice, didn't produce any respiratory depression or show signs of addictive qualities common with fentanyl, according to McLaughlin. While the study's findings, which were recently published in the journal *Nature*, are promising, McLaughlin cautions that more research is needed to make sure this alternate [fentanyl](#) is safe.

"Hopefully, everything we do, ideally, leads to something that improves the quality of life for patients and given that we have a severe opioid epidemic in this country that's driven in large part by a significant clinical problem treating pain, it's important to me to know that maybe we can make a contribution to help those folks who are in pain live their lives a little better," McLaughlin said.

Other scientists involved in the study included Nobel Prize winner Brian Kobilka and Georgios Skiniotis from Stanford University; Vsevolod Katritch from the University of Southern California; and Tao Che and Susruta Majumdar of Washington University in St. Louis.

## **What needs to be done in Florida**

While finding ways to make patients less dependent on opioids can be part of the solution, experts say other steps need to be taken to curb the opioid epidemic in Florida and nationwide stemming from people buying drugs on the streets.

Ward, the FIU professor, found in her research that nonfatal opioid-related overdoses increased in Florida during the first six months of the COVID-19 pandemic, which began in March 2020.

The findings of the study, which compared nonfatal opioid-related overdoses in Florida using naloxone (Narcan) distributed by emergency medical services during the first six months of the COVID-19 pandemic in 2020 to the same time period in 2019, suggest that women in rural counties, Hispanics and people in counties with limited opioid use disorder treatment options "may have been particularly impacted by increases in opioid-related overdoses" during the early months of the pandemic.

"Expanding access to services that support treatment and recovery for groups that have not traditionally been the focus of outreach efforts is critical to addressing the ongoing opioid crisis in Florida," the study noted.

Destigmatizing [substance abuse](#), improving access to [mental health care](#) and to providers who can treat [substance use disorders](#) are necessary steps in this fight against overdoses, said Ward. Fentanyl test strips, which would let people test their substances before using them, and syringe exchange programs like the IDEA Needle Exchange in Miami could also help curb fatal overdoses.

In 2019, the Exchange reported to the Florida Department of Health that it had 1,075 overdose reversals and a significant decrease in [opioid](#)-related deaths in Miami-Dade even though deaths were surging in other parts of the state.

"Drugs are not going away and there's always going to be new ones and new mixes," said Sims of the Miami Recovery Project. "Our job is to be there and support people and educate people about those potential

overdose effects and the effects of their life."

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