

Marijuana, meth, cocaine and opiate use are linked to atrial fibrillation

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A new study by UC San Francisco researchers of more than 23 million people concludes that some commonly used and abused drugs pose previously unidentified risks for the development of atrial fibrillation (AF), a potentially deadly heart-rhythm disorder.

The researchers analyzed data from diagnostic codes from every hospital admission, emergency room visit and [medical procedure](#) in California for the years 2005 through 2015, identifying nearly one million people who had no preexisting AF, but who later developed AF during these years. Among patients in the databases examined, 132,834 used cannabis, 98,271 used methamphetamine, 48,700 used cocaine, and 10,032 used opiates.

In the longitudinal study, published in the *European Heart Journal* on October 17, 2022, the UCSF scientists found that [marijuana users](#) had a 35 percent increased likelihood of later developing AF.

"Despite exhibiting a weaker association with incident AF than the other substances, cannabis use still exhibited an association of similar or greater magnitude to risk factors like dyslipidemia, diabetes mellitus, and chronic kidney disease. Furthermore, those with [cannabis use](#) exhibited similar relative risk of incident AF as those with traditional tobacco use," the study authors reported.

"To my knowledge, this is the first study to look at marijuana use as a predictor of future atrial fibrillation risk," said principal investigator Gregory Marcus, MD, MAS, a UCSF professor of medicine with the Division of Cardiology.

AF is an abnormally disordered pumping rhythm arising from electrical disturbances in the heart's upper chambers, the atria. In severe cases of faulty atrial pumping, clots may form in the atria, and then break off into the bloodstream and cause deadly strokes. AF-related strokes cause more than 150,000 US deaths each year.

Unlike cocaine or methamphetamine use, both stimulants previously known to sometimes lead to [sudden cardiac death](#) due to profound disruptions in the orderly electrical signaling and pumping within the

heart's other chambers—the ventricles—there is no demonstrated mechanism whereby marijuana use causes heart arrhythmias.

The study was not designed to probe specific marijuana constituents that might be responsible for elevated AF risk, but inhaled particulates are a likely factor, according to Marcus.

There is some evidence from previous studies that particulate matter—as from the known risk factor tobacco smoke—can increase the likelihood of an AF episode among those already diagnosed with the disorder. Particulate matter inhalation increases inflammation, and inflammation is a known trigger for AF, Marcus said.

"It's also intriguing to consider that inhaled substances travel directly from the lungs to pulmonary veins, which empty into the left atrium, and that the pulmonary veins and the left atrium are especially important in generating AF," Marcus said.

He hopes to conduct controlled studies in humans to more directly study the effects of marijuana on heart rhythm, and to further investigate possible mechanisms through which use of the other drugs may lead to increased AF risk.

Highest AF Risk Found for Methamphetamine

Marcus's research team found that methamphetamine use increased AF risk the most—by 86 percent in those whose medical records pointed to methamphetamine use compared to those whose medical records did not indicate use. Cocaine was associated with a 61 percent increase in AF risk, and use of opiates was associated with a 74 percent increase in risk.

To conduct the study, the scientists obtained medical records from the

Office of Statewide Health Planning and Development, California State Ambulatory Surgery databases, Emergency Department databases, and State Inpatient databases. Individuals were not identifiable.

Research cited by the [Centers for Disease Control and Prevention](#) indicates that marijuana use is increasing—there are about currently 48 million people in the United States who use marijuana each year—and about nine percent of first-time cannabis users become drug-dependent within a decade. According to the [CDC](#), U.S. opiate overdose deaths rose to 80,816 in 2021, while methamphetamine overdose deaths increased to 32,856. It is likely that the prevalence of more insidious harms is increasing as well, according to Marcus.

"Efforts to reduce substance abuse have the potential to reduce long-term cardiovascular complications associated with AF," he said.

More information: Anthony L Lin et al, Cannabis, cocaine, methamphetamine, and opiates increase the risk of incident atrial fibrillation, *European Heart Journal* (2022). [DOI: 10.1093/eurheartj/ehac558](#)

Provided by University of California, San Francisco

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