

Cardiac arrest from opioid overdose has unique features affecting prevention and treatment

8 March 2021



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Out-of-hospital cardiac arrests triggered by opioid overdose are a significant cause of death among adults 25 to 64, according to a scientific statement from the American Heart Association, the nation's largest voluntary health organization focused on heart and brain health for all. The statement published today in the Association's flagship journal *Circulation*.

In the U.S., opioid use disorder affects an estimated 2 million people each year and costs more than \$78 billion in health care expenses. The [opioid epidemic](#), which spans more than three decades, accounted for approximately 128 deaths a day in 2018, mostly among adults ages 25 to 55. And, more than 15% of the opioid overdose emergency medical service cases in 2016 included [cardiac arrest](#).

Opioid-associated out-of-hospital cardiac arrest differs from other forms of cardiac arrest in terms of how it abnormally changes body functions and

the different ways it presents. Opioids include prescription medications, as well as nonmedical and synthetic opioids restricted to hospitals such as heroin and fentanyl, respectively. In the case of opioid use disorder, they are frequently mixed with alcohol or other toxic substances, which increases the risk of overdose.

Cameron DeZfulian, M.D., FAHA, lead author and vice chair of the scientific statement writing group, said, "This evidence-based review is valuable to help improve prevention and treatment of opioid-associated out-of-hospital cardiac arrest, which primarily affects people in the prime of adult life. And, there are important scientific elements to be aware of since this type of cardiac arrest is fundamentally different from adult out-of-hospital sudden cardiac arrests, which have been more often studied."

The scientific statement defines the unique features of opioid-associated cardiac arrest, explains how body functions are affected and provides guidance on treatment options.

DeZfulian, who is senior faculty in pediatric critical care medicine at Baylor College of Medicine and medical director of the Adult Congenital Heart ICU at Texas Children's Hospital in Houston, explains that in opioid-associated cardiac arrest, hypoxia (oxygen deficiency) happens before the heart stops and has important implications for brain injury. Without oxygen, the brain is damaged within minutes even before the heart stops. These findings point to the need for further research to understand and appropriately treat these complications that result from opioid-associated cardiac arrest, especially potential brain injury and possible use of treatments that can protect the brain.

Naloxone, an urgent first treatment for overdose, can rapidly and effectively reverse respiratory depression or hypoventilation caused by opioids. Emergency medical services responders, trained laypeople and the [general public](#) (with the support of 911 emergency dispatcher instructions) can administer naloxone to prevent cardiac arrest. Traditional CPR including airway and rescue breathing support can also be effective.

Yet people who experience opioid-associated out-of-hospital cardiac arrest are more likely to be alone at home or in a private setting—away from someone who would witness the early signs of cardiac arrest and act. There is also evidence of underreporting due to the stigma associated with opioid poisoning and the potential for criminal charges to others in possession of opioids.

"Optimizing outcomes after cardiac arrest associated with opioid overdose requires recognition of distress by another person—the lay public or emergency dispatchers, prompt emergency response, and treatment with naloxone or CPR ventilation coupled with compressions," said Dezfulian. Prompt naloxone use can prevent progression from respiratory to cardiac arrest; increasing access to this life-saving drug is one way to prevent opioid-associated cardiac arrests.

Because opioids often remain in the body for several days, when it comes to attempting to predict outcomes, patience is critical. The statement recommends delaying decisions about stopping life-saving efforts until there has been time for the medications to clear from the patient's system, specifically until:

- at least 72 hours after the return of spontaneous circulation and normothermia (normal body temperature);
- [toxic substances](#) and their metabolites have cleared; and
- ICU-administered sedatives and analgesics have cleared.

Education may be another critical component in the fight against opioid overdose and opioid-associated out-of-hospital cardiac arrest.

"Targeted educational campaigns providing opioid use disorder education and prevention information, naloxone distribution and conventional CPR training, including rescue breathing, to those likely to have or witness an [opioid overdose](#) could help prevent and improve treatment of opioid-associated out-of-hospital cardiac arrest," Dezfulian said. "Along with broader public education, legal reforms and policies aimed at preventing [opioid-associated cardiac arrest](#) can save lives and should include resources for medication treatment in order to improve recovery for a generally young otherwise healthy segment of our population."

More information: Cameron Dezfulian et al, Opioid-Associated Out-of-Hospital Cardiac Arrest: Distinctive Clinical Features and Implications for Health Care and Public Responses: A Scientific Statement From the American Heart Association, *Circulation* (2021). DOI: [10.1161/CIR.0000000000000958](https://doi.org/10.1161/CIR.0000000000000958)

Provided by American Heart Association

APA citation: Cardiac arrest from opioid overdose has unique features affecting prevention and treatment (2021, March 8) retrieved 20 June 2021 from <https://medicalxpress.com/news/2021-03-cardiac-opioid-overdose-unique-features.html>

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