

When naloxone isn't enough: How technology can save lives when people use drugs when they're alone

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The Brave Button, designed to be installed in supportive housing, veteran housing, emergency shelters and complex care environments, keeps residents safe by allowing them to connect with staff when they need care. Credit: Brave Technology Co-Op

When Ju Park was studying epidemiology in graduate school, she

volunteered with a harm reduction organization that trained local community members on how to prevent a drug overdose. She traveled around the state to demonstrate how the medication naloxone can be used to reverse an overdose from opioids if administered in a timely manner.

After one session, a mother whose daughter had a substance abuse disorder approached Park to share a heartbreaking story: The daughter, who had been in and out of rehabilitation centers, recently experienced a relapse. She locked herself into a bathroom alone, overdosed on drugs, and died. The mother expressed gratitude for the naloxone training and told Park that she was eager to do more to help other families dealing with addiction. Park couldn't bear to tell the woman what she was thinking: Training bystanders how to administer naloxone wouldn't have saved her daughter, because nobody had been present to help.

"It made me wonder: What are we doing to help people who are using drugs alone and in secret?" recalled Park, who is now an assistant professor of epidemiology (research) at Brown University's School of Public Health and an assistant professor of medicine (research) at Brown's Warren Alpert Medical School.

That question continued to preoccupy Park as she established the Harm Reduction Innovation Lab at Rhode Island Hospital with the mission to develop, implement and evaluate interventions to promote the health and well-being of people who use drugs.

One approach that may point toward an answer: [overdose](#) detection technologies that actively or passively monitor, detect and alert responders of a potential overdose event. Park is the lead author of a new *JAMA Psychiatry* commentary that explains what these technologies are and how they work. The title belies the authors' optimism around these emerging tools: "A New Frontier in Preventing Solitary Drug

Overdose Deaths."

Park and her team aren't just talking about overdose detection technologies—they are engaged in high-impact research to learn if these tools make sense for Rhode Islanders, and how the technologies could be used to address the opioid crisis locally as well as in the rest of the country.

Solitary drug use and the risk of dying alone

Two years ago, when Park joined the Brown faculty, the U.S. Centers for Disease Control and Prevention released data showing that almost half of people who use drugs reported using alone, and 90% of overdoses were unwitnessed by another person. A [study co-authored by Park](#) of people who use drugs in Baltimore, Providence and Boston found that nearly half of the respondents reported usually using drugs alone. These numbers were even higher than Park expected.

The under-addressed issue of solitary drug use presents a major problem: Naloxone can stop overdoses, but administration of the medication requires a bystander who is trained, equipped and willing to respond to an overdose within minutes. And as in the story shared by the mother Park met, when people relapse in secret or take drugs alone, there is no witness to help and no time to waste. The data revealed a need for in-the-moment and community-led interventions to complement existing overdose prevention efforts.

Through the Center of Biomedical Research Excellence (COBRE) on Opioids and Overdose at Rhode Island Hospital, Park had connected with the Brave Co-Op, a developer of overdose detection tools, and became curious about existing innovations. Information was scarce, so she collaborated with researchers from Boston College, Johns Hopkins University and Brown to conduct the first literature review of overdose

detection technologies. The review, published in January in the *International Journal of Environmental Research and Public Health*, found that only a small number of technologies designed to assist in overdose detection and response are commercially available in the U.S., although several are in the early stages of development.

The new paper in *JAMA Psychiatry*, by Park and Josiah Rich and Traci Green—two faculty members affiliated with Brown's public health and medical schools who lead the COBRE opioids and overdose research center at Rhode Island Hospital—analyzes the feasibility of overdose detection technologies, including telephone-based interventions, [mobile applications](#), stationary wired/[wireless devices](#) and wearable biosensors that can monitor movement or oxygen levels. It also highlights the need for a new approach.

"Amid historical high rates of opioid and nonopioid overdose deaths, social isolation, and other potential health concerns in community settings, novel [overdose detection technologies] are important harm reduction measures to consider evaluating, while existing overdose interventions, such as naloxone and medications for opioid use disorder, reach scale," they wrote.

The researchers noted that while the technologies are targeted at people using drugs alone, they work by involving community helpers. Telephone services such as the "Never Use Alone" hotline can provide virtual monitoring during periods of drug use as well as emotional support and links to services, and can even dispatch emergency responders. Mobile apps including Canary and Brave, while requiring regular access to a smartphone, electricity and internet, allow people who use drugs to privately call for assistance and preserve autonomy.

The Brave Button is a wall-mounted wireless device that can be activated by people using drugs or bystanders to anonymously send a text alert to

pre-trained responders, and the Brave Sensor detects when a person has stopped moving or breathing and sends an emergency text to responders. The advantages to these types of environmental monitors, Park said, is that they may be able to detect non-drug related medical emergencies as well, such as a person who falls unconscious in the bathroom of a library or restaurant.

In their paper, Park, Rich and Green make the case for widespread testing of overdose detection technologies.

"If successful, such technology-assisted interventions will represent a major expansion in the field of overdose prevention," they conclude.

A community-first approach to testing technology

As part of an effort called the Overdose Detection Technology Project, Park's lab is doing the groundwork to eventually test whether such technologies can reduce deaths from opioid overdoses.

To better understand how these interventions might benefit people in Rhode Island, researchers from the lab are conducting usage training and surveying the attitudes and awareness of Rhode Island businesses, nonprofits and hospitals.

"It's been eye-opening to learn how many businesses don't train their staff to use naloxone and have never heard of these technologies, but are interested in learning more," Park said.

The researchers are also conducting focus groups with people who use drugs, and asking them whether and how overdose detection technologies would fit into their practices.

"We're trying to understand where the local community is at in terms of

applying these technologies, and how we can effectively put them into practice," Park said.

The overdose detection tools developed by Brave are already in use at housing facilities in the U.S. and Canada. Park hopes to conduct a randomized trial to test their effectiveness in different settings in Rhode Island, with the goal of sharing that data with states across the country.

"These life-saving interventions are already in use in different communities, but we don't have an understanding of how impactful they can be on a larger scale," she said.

Technological devices alone cannot address the issue of overdoses, Park emphasized. But they may prove to be a valuable complement to existing harm reduction interventions.

"The house is burning—100,000 people died nationally last year from drug overdoses, which is a historical high," Park said. "We're in crisis mode, and it's time for innovative solutions."

More information: Ju Nyeong Park et al, Overdose Detection Technologies—A New Frontier in Preventing Solitary Drug Overdose Deaths, *JAMA Psychiatry* (2023). [DOI: 10.1001/jamapsychiatry.2023.0546](https://doi.org/10.1001/jamapsychiatry.2023.0546)

Alexa Rose Lombardi et al, Overdose Detection Technologies to Reduce Solitary Overdose Deaths: A Literature Review, *International Journal of Environmental Research and Public Health* (2023). [DOI: 10.3390/ijerph20021230](https://doi.org/10.3390/ijerph20021230)

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