

8 Innovative Devices for Overdose Prevention

NATIONAL
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New technologies under development could transform how we prevent and respond to drug overdoses. Emerging devices to prevent overdose come in three categories: wearable devices that monitor an individual's vital signs, spatial devices installed in shared or public spaces and medical devices requiring subcutaneous insertion or implantation.

While overdose prevention devices hold immense potential to save lives, critical questions remain about their widespread adoption and practical implementation. Key concerns include:

- Price, insurance reimbursement and market viability.
- Emerging Food and Drug Administration (FDA) regulations and monitoring.
- Stigma and the perceived invasiveness of monitoring or implanted devices, which might deter adoption among people with histories of criminal justice involvement or those who already mistrust systems collecting sensitive data.
- Notification-induced panic, where device alerts sent to family or friends rather than emergency responders lead to unsafe responses.

Each device may appeal to different groups, like occasional users, those with severe or chronic use, or even families, communities and providers. Understanding these devices' capabilities and their potential benefits is essential to addressing these concerns and unlocking their life-saving potential.

Wearable devices



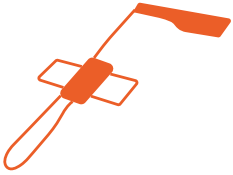
Ayuda Armband

- **How It Works:** The device continuously monitors motion, breathing patterns and oxygen levels. When signs of an overdose are detected, it triggers an alarm and sends notifications through a companion app to preselected contacts or response teams.
- **Where It Goes:** Worn on the bicep.
- **Response:** Sounds a loud verbal alarm and sends notifications to preselected emergency contacts or emergency services.
- **Developer:** Ayuda.
- **Stage:** In development; not yet approved by the U.S. Food and Drug Administration (FDA).



Pixel Watch 3

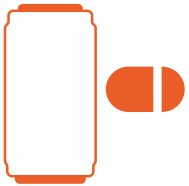
- **How It Works:** An opt-in feature known as loss of pulse detection monitors the wearer's vital signs. If it detects a loss of pulse, it activates an escalating alarm and contacts emergency services.
- **Where It Goes:** Worn on the wrist like a standard watch.
- **Response:** Activates an escalating audible alarm to alert nearby individuals and automatically calls emergency services with location data if available.
- **Developer:** Google.
- **Stage:** Available in select non-U.S. markets.



Opioid Halo™

- **How It Works:** The device monitors respiratory patterns and oxygen levels to detect slowed breathing caused by opioids. When signs of overdose are detected, it sends escalating alerts and can dispatch emergency services.
- **Where It Goes:** Worn on the body with a connected home hub for data processing.
- **Response:** Sends escalating alerts to emergency contacts and dispatches emergency services through an automated wellness call.
- **Developer:** Masimo.
- **Stage:** Pre-order; authorized by the FDA for use in overdose prevention.

Spatial devices



Brave Sensors

- **How It Works:** Motion sensors monitor public spaces, detecting prolonged stillness or inactivity that could indicate an overdose. When criteria are met, the system sends alerts to responders.
- **Where It Goes:** Installed in public bathrooms, transit hubs and other shared spaces.
- **Response:** Sends alerts to preselected employee responders for overdose intervention.
- **Developer:** Brave Technology Co-op.
- **Stage:** Available for installation in various public and community spaces.



LifeguardLite™

- **How It Works:** Has a 'use alone timer' feature where individuals using drugs activate a timer before consuming their substances. If the timer expires without the user interacting with the device to confirm their wellbeing, an alarm sounds and staff or emergency services are contacted.
- **Where It Goes:** Mounted on walls in supportive housing units, public restrooms or safe injection sites.
- **Response:** Sounds an alarm, alerts staff first and then escalates to contacting emergency services.
- **Developer:** Lifeguard Digital Health.
- **Stage:** Available for installation in housing and public facilities.

Medical devices



s.c. Robotic Implant

- **How It Works:** The implant continuously monitors heart rate, breathing, and other vital signs. If an overdose is detected, it administers naloxone via a micropump to reverse the effects.
- **Where It Goes:** Implanted under the skin, typically in the abdomen.
- **Response:** Automatically administers naloxone and monitors vital signs post-administration.
- **Developer:** Massachusetts Institute of Technology and Brigham and Women's Hospital.
- **Stage:** In development; undergoing pre-market testing.



Closed-Loop Wearable Naloxone Injector

- **How It Works:** Respiration and motion sensors detect halted breathing or movement. If an overdose is detected, the device injects naloxone subcutaneously and transmits data to a connected app for monitoring.
- **Where It Goes:** Worn on the stomach, similar to an insulin pump.
- **Response:** Administers naloxone and notifies emergency contacts or responders via a connected app.
- **Developer:** University of Washington.
- **Stage:** In development; pending FDA approval.



Automatic Antidote Delivery Device

- **How It Works:** EKG sensors detect slowed respiration and trigger a magnetic field to release naloxone from a pre-injected capsule, buying time for responders to arrive.
- **Where It Goes:** EKG sensor worn on the chest; pre-injected capsule implanted under the skin.
- **Response:** Administers naloxone and automatically alerts emergency services.
- **Developer:** Purdue University.
- **Stage:** In development; patented but not yet FDA approved.