Health Alert Network (HAN)

Medetomidine in the U.S. Illegal Fentanyl Supply Increasing Risk for Overdose and Severe Withdrawal Syndrome

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AT A GLANCE

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Summary

The Centers for Disease Control and Prevention (CDC), in conjunction with the White House Office of National Drug Control Policy (ONDCP), is issuing this Health Advisory to notify public health professionals, clinicians, laboratorians, and people at risk for overdose about increasing reports from U.S. jurisdictions detecting medetomidine in the illegal drug supply and a severe withdrawal syndrome due to medetomidine exposure. Medetomidine (also known as 'rhino tranq,' 'mede,' or 'dex') is not approved for human use but is approved for sedation and analgesia in dogs. Its dextro-isomer, dexmedetomidine, is approved for procedural sedation in humans. Medetomidine has been increasingly detected in law enforcement drug seizures, drug product and paraphernalia samples, and in wastewater samples, with the highest concentrations in the Northeast region. Testing of illegal drug samples and clinical specimens has identified racemic mixtures of levomedetomidine and dexmedetomidine isomers without the preservatives commonly found in medical or veterinary formulations, making diversion of pharmaceutical products unlikely. Since pharmaceutical-grade products contain only dexmedetomidine, these findings suggest medetomidine is being synthesized in clandestine laboratories.

Medetomidine can cause profound sedation, bradycardia, and hypotension. Stopping medetomidine following regular use may lead to severe withdrawal, similar to clonidine withdrawal, with symptoms including hypertension, anxiety, nausea, vomiting, and fluctuating alertness, that can require emergency or intensive care. Because fentanyl is involved in most overdoses involving medetomidine, opioid overdose reversal medications (OORM; e.g., naloxone) should be administered to restore normal breathing in suspected overdoses.

Public health professionals can use syndromic surveillance to detect medetomidine-related intoxication or withdrawal signs and symptoms. Public health and public safety agencies and clinicians should collaborate to monitor the local drug supply and share timely information to align clinical and public health action. Clinicians should consider medetomidine in suspected opioid overdoses with prolonged sedation unresponsive to OORM administration, consult a toxicologist or poison control at 1-800-222-1222, and report unusual cases to the appropriate health department.

Background

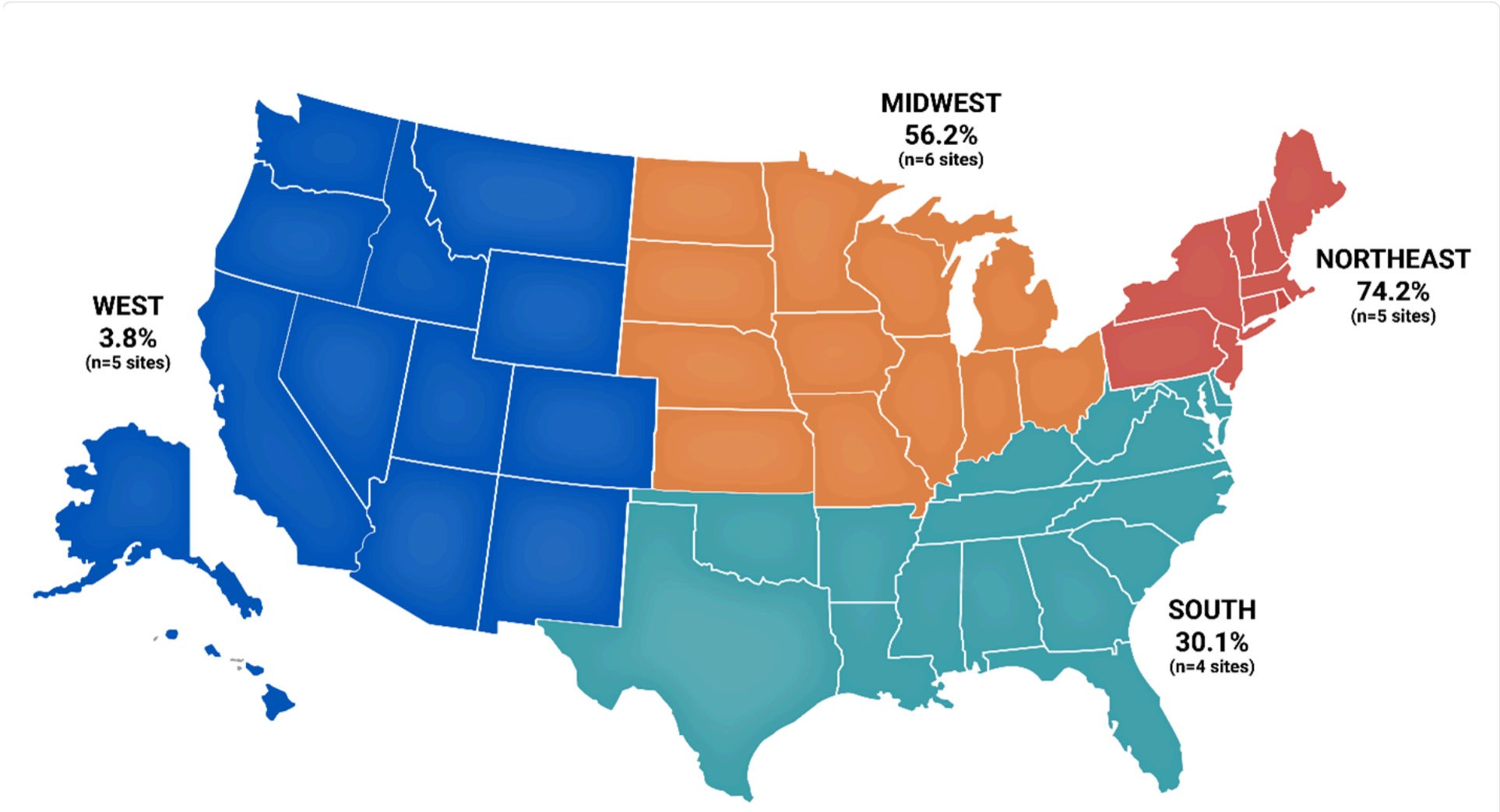
Despite declines in U.S. drug overdose deaths since 2022 that continued in 2025, the illegal drug supply remains unpredictable. Illegally made fentanyl continues to be involved in most overdose deaths and is frequently mixed with other drugs, such as benzodiazepines or xylazine. Medetomidine, an alpha-2 adrenergic agonist sedative, more potent and longer-acting than clonidine and xylazine, was first identified in the illegal drug supply in 2021 and began appearing sporadically with fentanyl in multiple jurisdictions including Chicago, Philadelphia PDF, and Pittsburgh from mid-2023 to mid-2024. By late July 2024, medetomidine had been detected in drug samples and biological specimens from people who use illegal opioids in at least 18 states and the District of Columbia.

The geographic spread of medetomidine appears to be expanding; the number of reports submitted to the National Forensic Laboratory Information System (NFLIS), which captures forensic laboratory findings from law enforcement drug seizures, increased by 950% from 247 in 2023 to 2,616 in 2024, followed by a further 215% increase to 8,233 in 2025. Medetomidine reports comprised <1% of all NFLIS drug reports

across the United States in 2025. They were most concentrated in the Northeast (52%) and Midwest (31%), followed by the South (17%) and the West (<1%).

From October 2025–January 2026, medetomidine was detected in treated wastewater every week in at least one of 14 states included in a wastewater testing program in the United States. Data from CDC's Overdose Data to Action (OD2A) program, which funds local health departments to conduct laboratory testing of drug products and paraphernalia, and the National Institute of Standards and Technology (NIST) RaDAR program, found that 10 of 20 sentinel sites detected medetomidine in almost 35% of opioid positive samples during July 2025–December 2025 (Figure). These sites were most often located in Northeastern states (n=5 of 5 sites), followed by Midwestern states (n=4 of 6 sites), and Southern states (n=1 of 4 sites). All five sites in the Western states detected medetomidine in their opioid positive samples, but at low levels, ranging from 2% to 8%. Eight sites detected medetomidine in more than 50% of opioid-positive samples. Among drug product samples (e.g., powder or pills) with positive test results for medetomidine (n=995) from July 2025–December 2025, 98% had fentanyl co-detected, consistent with reports of medetomidine being mixed into products sold as fentanyl, as noted in local advisories.

Figure: Percentage of opioid-positive drug product and paraphernalia samples also positive for medetomidine across 20 sentinel sites[a]: US region, July 2025–December 2025 (Provisional data)[b,c]



a. 20 sites include Midwest (Chicago Dept. of Public Health, IL; Cuyahoga County Board of Health, OH; Hamilton County Public Health, OH; Health and Hospital Corporation of Marion County, IN; Saint Louis County Dept. of Public Health, MO; Sedgwick County Health Dept., KS), Northeast (Allegheny County Health Dept., PA; City of Hartford Health and Human Services, CT; Fund for Public Health in New York City, NY; Philadelphia Dept. of Public Health, PA; Savage Sisters Recovery [Philadelphia, PA] in collaboration with Friends Research Institute), South (Florida Dept. of Health - Broward County, FL; Delaware Department of Health and Social Services; Maryland Dept. of Health; Florida Dept. of Health - Palm Beach County, FL), West (Alameda County Health Care Services Agency, CA; Denver Dept. of Public Health and Environment, CO; Los Angeles County Dept. of Public Health, CA; Public Health - Seattle & King County, WA; Southern Nevada Health District, NV).

b. Total number of samples tested per site ranged from 102 to 1,216 (median=308) and are a convenience sample. Thus, overall percentages are not representative of drug use locally or regionally.

c. Types of samples (e.g., drug products versus drug paraphernalia) tested varies across sites. Thus, the presence of drugs in the drug market is overestimated as drug paraphernalia may be used multiple times by multiple people and drug samples can be contaminated at trace amounts due to storage or handling.

Reported effects of medetomidine intoxication are consistent with those of alpha-2 agonists and include:

- marked bradycardia (heart rates as low as 32 beats per minute),
- hypotension, and
- profound, often prolonged sedation.

Unlike xylazine, medetomidine use does not seem to be associated with development of wounds.

Because fentanyl is involved in most overdoses involving medetomidine, OORMs should be administered in an attempt to restore normal breathing in suspected overdoses. OORMs like naloxone are effective in reversing opioid effects but are not effective in reversing the effects of medetomidine or other drugs that may have been consumed. Consequently, while apnea may be reversed with naloxone, sedation may not be reversed. The frequency of respiratory support and intensive care unit (ICU) management for medetomidine-involved overdoses is comparable to that for opioid or stimulant overdoses not involving medetomidine, unless withdrawal signs are present.

Emergence of medetomidine in the illegal opioid supply has been associated with overdose clusters, including one in Chicago in May 2024 with 12 confirmed, 26 probable, and 140 suspected medetomidine-involved overdoses; fentanyl was detected in all medetomidine-positive samples. Most patients exhibited findings typical of opioid overdose and suggestive of opioid co-involvement (altered mental status, pinpoint pupils, hypoxemia). Most had significant bradycardia due to medetomidine's alpha agonist effect, with some requiring atropine. At least 16 people were hospitalized and one died.

Stopping medetomidine following regular use can precipitate a severe withdrawal syndrome, similar to clonidine withdrawal, that can require emergency or intensive care. Withdrawal symptoms are marked by:

- tachycardia (>100 beats per minute),
- severe hypertension,
- fluctuating alertness,
- tremor,
- chest pain, and
- intractable nausea and vomiting.

Withdrawal symptoms may begin within hours of last use and peak 18–36 hours later. Complications such as non-ST elevation myocardial infarction and posterior reversible encephalopathy syndrome have been associated with severe medetomidine withdrawal. Increases in emergency department visits for non-alcohol, non-nicotine, and non-cannabis withdrawal have been temporally associated with medetomidine detection in the drug supply, with sustained prevalence linked to substantial emergency department and ICU utilization. From September 2024–January 2025, 165 patients across three Philadelphia health systems were hospitalized for fentanyl withdrawal complicated by severe autonomic dysfunction. Similar presentations were reported in Pittsburgh (October 2024–March 2025), where many patients required dexmedetomidine infusions and ICU-level care, and in Maryland (July 2025–August 2025), where medetomidine-related overdoses were frequently accompanied by withdrawal signs and symptoms.

CDC supports states and local communities in detecting, preventing, and responding to health threats through ongoing technical assistance and support through CDC's Overdose Data to Action (OD2A) cooperative agreement and the Overdose Response Strategy (ORS). ONDCP develops the National Drug Control Strategy to coordinate government efforts to reduce the supply of and demand for illicit drugs, and tracks and communicates about evolving and emerging threats.

Recommendations for Public Health Professionals

- Use existing surveillance systems to identify spikes in overdose or withdrawal that may indicate a broader shift in the illicit drug supply (e.g., syndromic emergency department data PDF, emergency medical services data, commercial laboratory data, poison center data, and medical examiner/coroner data). Syndromic emergency department data sources include CDC's Drug Overdose Surveillance and Epidemiology (DOSE) system and the National Syndromic Surveillance Program (NSSP) may help detect potential increases in medetomidine withdrawal and highlight the need for further investigation and education of hospitals, health care organizations, and public health agency professionals.
- Communicate across hospitals, health care organizations, and public health agencies to share awareness, data, and expertise about overdose and withdrawal.
    - Consider the potential need for higher levels of care for opioid withdrawal management when medetomidine is also involved.
    - Recognize that medetomidine exposure without medetomidine withdrawal has been found to require similar levels of respiratory support and intensive care as patients with opioid or stimulant overdose not involving medetomidine.
- Emphasize OORMs, such as naloxone, in overdose response education to restore breathing. When medetomidine is involved in an overdose, illegal opioids (usually fentanyl) are almost always co-involved.
    - Repeat naloxone every 2-3 minutes as needed to make sure the person takes at least one breath every 5 seconds.
    - Administer the OORMs needed to restore breathing rather than attempting to restore alertness.
    - Place the person in the recovery position, ensuring the airway is clear.
    - Recognize sedation from medetomidine will wear off over time.

Recommendations for Clinicians

- Use heart rate to help differentiate between sedation from medetomidine toxicity and overdose (associated with bradycardia) and decreased alertness from medetomidine withdrawal (associated with tachycardia and hypertension).
- For any suspected overdose, administer the amount of OORMs, such as naloxone, needed to restore breathing. While OORMs do not reverse medetomidine overdose, illegal opioids (usually fentanyl) are nearly always co-involved when medetomidine is present in an overdose.

- Consider potential medetomidine toxicity or other polydrug intoxication when patients presenting with suspected opioid overdose experience prolonged sedation continuing even after adequate OORM administration.
    - Consider comprehensive drug screening, including medetomidine in blood (preferred) and 3-hydroxy medetomidine or medetomidine with deconjugation in urine, for individuals who present in emergency departments for a suspected drug overdose. Medetomidine is not typically included in hospital rapid drug screens. In addition, medetomidine is metabolized rapidly and can be challenging to detect by the time patients are experiencing withdrawal.
    - Hospital rapid drug screens may or may not include fentanyl so check with the hospital's laboratory. Any hospital equipped with a chemical analyzer can adapt the analyzer to include fentanyl in a rapid urine drug screen.
- Recognize that patients who exhibit tachycardia, severe hypertension, fluctuating alertness, tremor, chest pain, or intractable nausea and vomiting, and those who do not improve after opioid withdrawal treatment may be experiencing medetomidine withdrawal syndrome.
- Treat medetomidine withdrawal to reduce severe effects and prevent end-organ damage. Emerging guidance suggests that medetomidine withdrawal management should include
    - opioid withdrawal management;
    - alpha-2 agonist therapy with clonidine and dexmedetomidine if needed;
    - treatment of agitation as needed; and
    - hypertension management (preferably via withdrawal management).
- Consider observing patients with suspected prolonged periods of heavy medetomidine use for signs of medetomidine withdrawal for several hours after last use. While withdrawal symptoms peak at 18-36 hours after last use, patients who do not show signs of medetomidine toxicity or withdrawal within 6-12 hours are less likely to experience severe withdrawal.
- Consult a toxicologist or contact your local Poison Center (1-800-222-1222) for advice on diagnosing and managing medetomidine toxicity or withdrawal.
- Notify your health department if you observe or learn of unusual overdoses or other adverse events, including signs or symptoms consistent with medetomidine-involved overdose or medetomidine withdrawal.
- Offer or arrange evidence-based treatment for substance use disorders including medications for patients with opioid use disorder. For clinician support, the Health Resources & Services Administration funded Substance Use Warmline offers confidential, free teleconsultation on substance use evaluation and management (844-275-6222; Monday–Friday, 7 a.m.–5 p.m. PT, excluding holidays).
- Clinicians can also contact DEA TOX Toxicology Testing Program at deatox@dea.gov to request drug testing of clinical samples from potential drug poisonings that are not explained by other clinical testing.

Recommendations for Laboratories

- Consider testing drug products or paraphernalia for medetomidine.
- Screen for novel psychoactive substances, including medetomidine, prevalent in your region or when an unexplained increase in drug overdoses occurs. This is particularly relevant for medical examiners and coroners to determine if medetomidine was involved in overdose deaths.
- Validate and test for medetomidine using the Association of Public Health Laboratories (APHL) Polysubstance Overdose Expanded Biosurveillance Strategy PDF guidance when implementing opioid biosurveillance to track state-level medetomidine detections.
- Use CDC's Traceable Opioid Material® Kits (TOM Kits®). This product line provides reference materials enabling laboratories to screen for a variety of substances that contribute to nonfatal and fatal overdose. Emergent Drug Panel (EDP) Kits screen for 80 emergent synthetic opioids, benzodiazepines, stimulants, hallucinogens, synthetic cannabinoids, and xylazine.

Recommendations for People at Risk for Overdose

- Carry an OORM like naloxone and have a plan to use it by keeping it accessible, letting others know where it is, and calling 911 after administering it.
- Use drug test strips to detect substances in different kinds of drugs. Drug test strips are available for some substances, such as fentanyl, xylazine, and medetomidine. However, test strips can have false negative results, meaning the strip does not show the presence of a substance like fentanyl when in fact it is present in the product. Test strips also do not detect some fentanyl analogs (like carfentanil).
- Ask for help to address drug use. Addiction, also known as substance use disorder, is a treatable chronic condition. There are effective treatments, including medications for opioid addiction. To find treatment:

    - Call or text 988
    - Call SAMHSA's helpline at 1-800-662-4357 for support or information on treatment and recovery
    - Visit https://findtreatment.gov/
    - Ask your doctor, or
    - Go to an emergency department.
- Avoid mixing substances that have sedating effects, such as alcohol, benzodiazepines, opioids or other sedating substances like medetomidine, because of increased overdose risk.
- Be alert for potential medetomidine withdrawal, which can escalate quickly and result in dangerously high blood pressure and severe damage to the heart or brain.
- Seek medical care for potential medetomidine withdrawal, which can escalate quickly and result in dangerously high blood pressure and severe damage to the heart or brain. Go to the hospital or call 911 if you:
    - Can't stop throwing up
    - Have chest pain
    - Are going in and out of awareness
    - Are experiencing severe withdrawal symptoms

For More Information

Medetomidine and its effects

- Medetomidine Situation Summary | CDC
- Medetomidine (Including Dexmedetomidine) | DEA PDF
- Medetomidine Withdrawal Palm Card | Philadelphia Department of Public Health
- Medetomidine Detection in the Illicit Drug Supply | Pennsylvania Department of Health PDF
- Medetomidine Alert | Chicago Department of Public Health

Diagnosis and treatment of medetomidine intoxication or withdrawal

- Medetomidine Webinar for Clinicians | CDC
- America's Poison Centers
- Medetomidine Withdrawal | New York City Department of Health and Mental Hygiene PDF
- Responding to overdose and withdrawal involving medetomidine PDF | Philadelphia Department of Health
- Severe and worsening presentations of withdrawal PDF | Philadelphia Department of Health
- Medetomidine | Penn Medicine Center for Addiction Medicine and Policy

Detection of emerging substances including medetomidine

- Rapid Drug Analysis and Research (RaDAR): Providing Near Real-Time Insight into the Illicit Drug Landscape | NIST
- DEA TOX Toxicology Testing Program | DEA
- Medetomidine – An Emerging Adulterant of Concern (presentation) | Center for Forensic Science Research and Education PDF

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U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES

HAN message types

- **Health Alert:** Conveys the highest level of importance about a public health incident.
- **Health Advisory:** Provides important information about a public health incident.
- **Health Update:** Provides updated information about a public health incident.

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This message was distributed to state and local health officers, state and local epidemiologists, state and local laboratory directors, public information officers, HAN coordinators, and clinician organizations.

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SOURCES

CONTENT SOURCE:

Office of Emergency Risk Communication (OERC)