February 5, 2026

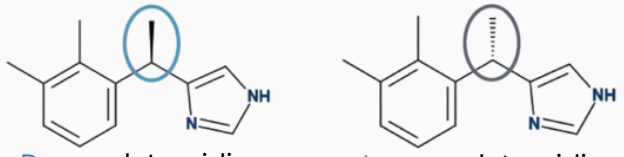
Medetomidine:
Rising Adulterant in the Illicit Drug Supply

Medetomidine is a potent, highly selective alpha-2 agonist increasingly being found in the illicit opioid supply.

What is Medetomidine?

Medetomidine is used as a veterinary sedative, similar to xylazine, but 100–200 times more potent, with a longer duration of action, and acts on both the central and peripheral nervous systems. Unlike xylazine, wounds have not been observed.

Stereoisomers: a mixture of two enantiomers



Dexmedetomidine (active) + Levomedetomidine (inactive)

Emergence into the Illicit Drug Supply

In spring 2024, medetomidine was detected in several overdoses in Philadelphia and Chicago. Months later, a new withdrawal syndrome emerged. By Q4 2024, 72% of illicit opioids tested in Philadelphia were positive for medetomidine. By September 2025, it had been detected in at least 18 states, but it remains more prevalent in Pennsylvania and surrounding states.

Medetomidine Withdrawal Syndrome

Withdrawal from medetomidine is ***more severe*** and ***prolonged*** than xylazine, with symptoms starting as soon as ***1-2 hours after last use***.

- Nausea and vomiting
- Tremor and myoclonic jerks
- Anxiety
- Diaphoresis
- Sinus tachycardia (>120 bpm)
- Hypertension (SBP>170mmHg; DBP>100mmHg)
- Encephalopathy or delirium in severe cases
- Minimal response to symptomatic therapies

The primary concern is tachycardia and hypertension. Severe vomiting may prevent oral medication use to control these. If vomiting persists, dexmedetomidine may be needed in the emergency department or ICU.

Overdose Management

Administer naloxone to restore breathing

During an overdose, the goal of naloxone administration is the restoration of respiratory effort, not wakefulness. Medetomidine may keep a person sedated even after successful opioid reversal.

Escalating Care

Indications for transfer to a higher level of care include:

- Severe hypertension (SBP ≥ 180 or DBP ≥ 120)
- Intractable nausea and vomiting
- Waxing and waning alertness or hypoactive delirium
- Severe symptoms that do not improve within 4-6 hours of initiating treatment

≥ one-third of patients require care in the ICU for 2-6 days.

Management Strategies: *Treat Aggressively*

ALPHA-2 AGONIST THERAPIES

- Clonidine PO (up to 0.4mg; Q2 if needed)
- Dexmedetomidine: consider boluses

OPIOID WITHDRAWAL MANAGEMENT

- Methadone PO or IV if unable to tolerate PO
- Scheduled short-acting oxycodone or hydromorphone PO
- Hydromorphone IVP PRN

Avoid early buprenorphine initiation based on COWS scores, which may be high from medetomidine withdrawal and cause precipitated withdrawal. Buprenorphine may still be suitable, but a micro-induction approach with short-acting full opioid agonists is recommended.

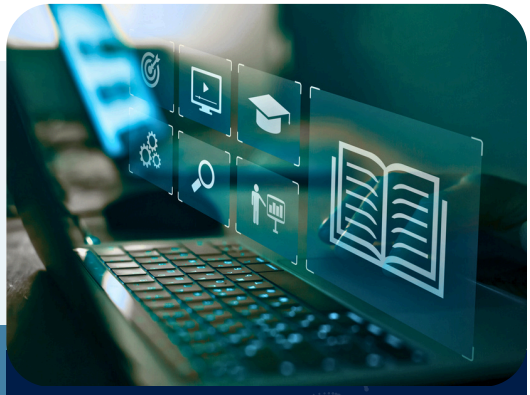
SYMPTOM MANAGEMENT

- Olanzapine for anxiety, nausea, and vomiting
- Prochlorperazine and droperidol for nausea and vomiting
- Short-acting opioids and ketamine PO, IV, or drip for pain

PHENOBARBITAL/BENZODIAZEPINE

- Phenobarbital for sedation (not routinely indicated unless there is concomitant benzodiazepine or ethanol withdrawal)
- Benzodiazepines are not effective

If patient shows signs of alcohol or benzodiazepine withdrawal but does not respond to benzodiazepines or barbiturates, consider adding dexmedetomidine. If patient responds, medetomidine withdrawal should be considered.



ADDITIONAL RESOURCES

Learn more and stay up to date using the resources and references below.

Center for Addiction Medicine and Policy: Penn Medicine

Emergence of Medetomidine in the Illicit Drug Supply: Implications for Emergency Care and Withdrawal Management: Annals of Emergency Medicine. 2026 Jan 22.

Medetomidine: Substance Use Philly

Medetomidine Infiltrates the US Illicit Opioid Market: JAMA. 2024 Nov 5;332(17):1425–1426

Responding to Overdose Withdrawal Involving Medetomidine: *Philadelphia Department of Public Health*

ASAM Practice Pearls: Medetomidine Podcast Episode

Monitor local drug-checking programs to determine whether medetomidine has spread to your area.