

Medetomidine

What Clinicians Need to Know



Department
of Health

What is Medetomidine:

- Medetomidine is a strong synthetic alpha2-adrenergic agonist, synthesized in 1962 as an analgesic, hypnotic, and anesthetic. It is a veterinary sedative, similar to xylazine, and it is not Food and Drug Administration (FDA) approved for use in humans.
- Medetomidine is similar to dexmedetomidine, an intravenous sedative approved for use as sedation in the intensive care unit (ICU) and peri-procedural (or peri-operative) sedation.
- Medetomidine is 100-200 times more potent than xylazine and can cause longer-lasting sedation, low heart rates, and more severe withdrawal symptoms. Thus far it has not been associated with the skin wounds found with xylazine.

Street Names:

- As an adulterant in illicit drugs (often mixed with fentanyl and xylazine), medetomidine has acquired several street names :
 - **Rhino Tranq** (rhino tranquilizer)
 - **Dex** (short for dexmedetomidine)
 - **Mede** (short for medetomidine)
 - **Tranq** (though this name is more commonly associated with xylazine, it is sometimes used for any tranquilizer in the illicit supply)

Why Do People Use Medetomidine or Xylazine with Fentanyl:

- The “high” from fentanyl lasts for a very short time compared to the effects of heroin and other opioids. Medetomidine and/or xylazine may be added, at least in part, to extend the effects of fentanyl. However, not everyone who uses fentanyl is intentionally seeking out medetomidine and/or xylazine. In many cases, people are not aware that medetomidine and/or xylazine is in the drugs they are buying and using.

Medetomidine Trends:

- Medetomidine was first noted in the illicit drug supply in the United States in 2021 and has spread rapidly to other regions of the country including New York State.
- New York State Drug Checking Programs first identified medetomidine in a sample provided in May of 2024. By October of 2024, over 23% of opioid samples collected contained medetomidine. Community drug checking data shows that medetomidine was detected in 31% of opioid samples collected in December of 2025.
- Of the 306 samples containing any medetomidine, from May 2024 through December 2025, fentanyl was the most common co-occurring substance (found in 91% of medetomidine samples).
- From May 2024 through December 2025, xylazine was detected in 54% of opioid samples tested. Xylazine was present in 74% of samples containing medetomidine.

Medetomidine Routes of Administration:

- Medetomidine is increasingly found as an adulterant in illicit drugs, particularly fentanyl. When used illicitly, the routes of administration include intravenous, intranasal, and oral; there is currently no known information on vaping or smoking.
- It has rapid onset within minutes and can last 8 hours or longer depending upon the dose, the way it was taken, and whether it was mixed with an opioid or other drug(s).

Medetomidine Effects:

Medetomidine is a central nervous system depressant that can cause drowsiness, amnesia, slow breathing, heart rate, and blood pressure at dangerously low levels. It also may intensify the effects of other sedating substances such as fentanyl. Effects observed include :

- **Profound Sedation:** This is the main effect, leading to extreme tiredness, dizziness, and loss of consciousness. Sedation can be prolonged, lasting for several hours or longer.
- **Cardiovascular Issues:** The drug can cause an initial spike in blood pressure followed by low blood pressure (hypotension), very slow heart rate, and decreased cardiac output.
- **Other Physical Symptoms:** Nausea, vomiting, blurred vision, confusion, dry mouth, and shaking/twitching have been reported.

Medetomidine Diagnostic Testing Challenges:

- Medetomidine is not included in routine immunoassay toxicology screens and therefore may be under-detected. Additional analytical techniques are required to detect medetomidine in biological specimens such as blood and urine and generally take several days.
- Medetomidine test strips have been developed, but they are not Clinical Laboratory Improvement Amendments (CLIA) waived so they are unavailable for clinical use.

Presentation and Management of Medetomidine-Involved Overdose

- Opioid overdose also involving medetomidine presents similarly to uncomplicated opioid overdose but with bradycardia. Medetomidine can potentiate the effects of other depressants, such as fentanyl and heroin.
- Medetomidine, while not a cause of the severe respiratory depression typical of opioid intoxication, does induce a profound mental status depression that carries a risk of airway compromise, potentially leading to suffocation.
- Naloxone should be administered for respiratory depression because medetomidine is nearly always found mixed with fentanyl in the illicit drug supply, and often other substances like xylazine.
- People may find that naloxone will appear to be ineffective in some overdoses, as medetomidine intoxication is not known to be reversed by naloxone. Patients should be educated about this to avoid incorrectly attributing these incidents to “naloxone-resistant fentanyl” or “naloxone-resistant opioids.”
- Be aware that the person may breathe normally after receiving naloxone but still be sedated from the medetomidine. More naloxone may not be needed.

Presentation and Management of Medetomidine-Involved Overdose (continued):

- There is no reversal agent for medetomidine that is safe for use in humans; supportive care is recommended, including rescue breathing and airway support. Blood pressure may be unstable and in need of monitoring or intervention.

Presentation and Management of Medetomidine Withdrawal:

- Medetomidine withdrawal is increasingly a concern. It was first noted when severe autonomic hyperactivity occurred in several patients after abrupt cessation of illegally manufactured opioid use. This may include agitation, severe hypertension, tachycardia and intractable vomiting. Encephalopathy and myocardial injury have been documented.
- Unlike opioid withdrawal medetomidine withdrawal may require hospitalization at times, including ICU care. And it may be further complicated by other syndromes including benzodiazepine withdrawal.
- Other alpha-2 agonist sedatives such as clonidine and/or dexmedetomidine may be needed.
- Opioid withdrawal should be treated early, with liberal use of medications such as methadone (be aware that buprenorphine can precipitate opioid withdrawal) or opioid pain management in order to mitigate any pain and discomfort that could further exacerbate the manifestations of medetomidine withdrawal, or lead to discharges against medical advice (or patient directed discharge) which, in one study, accounted for a third of the discharges.
- It remains unclear how much exposure to medetomidine is required for this level of dependence to develop or how common life-threatening withdrawal is. For information on clinical guidelines and withdrawal management related to medetomidine withdrawal syndrome, refer to the following resources (among others listed at the end of this document):

[CDC Health Alert Network: Medetomidine in the U.S. Illegal Fentanyl Supply Increasing Risk for Overdose and Severe Withdrawal Syndrome.](#)

[The Philadelphia Department of Public Health Health Update: Responding to overdose and withdrawal involving medetomidine.](#)

[The Philadelphia Department of Public Health Outpatient Medetomidine Withdrawal Treatment Guideline.](#)

Collaboration Required:

- The burgeoning medetomidine overdose threat demands coordinated actions from critical care specialists, addiction medicine specialists, and public health agencies to appropriately care for individuals in the acute phase and to offer medications for opioid use disorder (MOUD) to avoid future episodes.
- Clinicians, people who use drugs and those working with these populations need to be alert to the potential dangers of medetomidine withdrawal to respond quickly.

Basic Harm Reduction Messaging Providers Can Use with Patients:

- Go slow. Use less.
- Test your product if you can. 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).
- If you are using alone, double down on other strategies. Have someone check on you. If you are using in a group, stagger your use so someone is always alert.
- Carry naloxone and know how to use it. Look out for each other.
- Call 911; be aware that a medetomidine overdose may need more care than naloxone.
- Withdrawal awareness.
- Be sure the airway is open, as breathing may be blocked in slumped positions.

Providers should familiarize themselves with resources available for people who use drugs, including:

- Access a list of naloxone distribution programs in the [NYS DOH Opioid Overdose Prevention Locator](#).
- For safer use supplies and harm reduction services visit [Drug User Health Hub locator](#).
- For NYS DOH Drug Checking Program locations, visit the [NYS DOH Drug Checking Program website](#)

Overdose response hotlines for people who are using drugs alone:

- [Never Use Alone hotline](#): 877-696-1996
- [SafeSpot hotline](#): 800-972-0590

Additional Resources:

- <https://www.cdc.gov/han/php/notices/han00527.html> Medetomidine in the U.S. Illegal Fentanyl Supply Increasing Risk for Overdose and Severe Withdrawal Syndrome
- [Emergence of Medetomidine in the Illicit Drug Supply: Implications for Emergency Care and Withdrawal Management](#) Annals of Emergency Medicine, 2026. Lynch M, Pizon A, Yealy D.
- [University of Pennsylvania Center for Addiction Medicine and policy](#): Medetomidine
- [October 2025 Psychoactives article](#): Profound Opioid and Medetomidine Withdrawal: A Case Series and Narrative Review of Available Literature
- [October 2025 American Journal of Emergency Medicine article](#): Assessing the Cardiac Safety of a Multimodal Protocol for ‘Tranq Dope’ Withdrawal: A Retrospective QTc Analysis
- [Medetomidine Hospital Withdrawal Guidelines](#): Developed by Dr. Michael Lynch at the University of Pittsburgh and shared with his permission.
- [Medetomidine Outpatient Withdrawal Guidelines](#): Developed by Dr. Michael Lynch at the University of Pittsburgh and shared with his permission.

Additional Resources (continued):

- [August 2025 Journal of Addiction Medicine article](#): Severe Fentanyl Withdrawal Associated with Medetomidine Adulteration: A Multicenter Study from Philadelphia, PA
- [June 2025 PDPH Health Alert Network \(HAN\) Update](#): Responding to overdose and withdrawal involving medetomidine
- [May 2025 CDC Morbidity and Mortality Weekly Report \(MMWR\): Notes from the Field: Suspected Medetomidine Withdrawal Syndrome Among Fentanyl-Exposed Patients — Philadelphia, Pennsylvania, September 2024–January 2025](#)
- [May 2025 CDC MMWR: Notes from the Field: Severe Medetomidine Withdrawal Syndrome in Patients Using Illegally Manufactured Opioids — Pittsburgh, Pennsylvania, October 2024–March 2025](#)
- [May 2025 CDC MMWR: Overdoses Involving Medetomidine Mixed with Opioids — Chicago, Illinois, May 2024](#)
- [May 2025 BioMed article](#): Decreased Effectiveness of a Novel Opioid Withdrawal Protocol Following the Emergence of Medetomidine as a Fentanyl Adulterant
- [April 2025 Medetomidine PDPH CHART](#): Changes in Philadelphia’s Drug Supply and Substance Use-Related Emergency Department Visits
- [April 2025 Penn CAMP Webinar: An Emerging Adulterant in Philadelphia: Medetomidine Withdrawal in People Who Use Fentanyl](#)
- [December 2024 PDPH HAN Alert](#): Hospitals and behavioral health providers are reporting severe and worsening presentations of withdrawal among people who use drugs (PWUD) in Philadelphia
- [December 2024 Community Alert](#): Medetomidine is causing more severe withdrawal

For additional information about the substance use related activities of the New York State Department of Health, please see <https://www.health.ny.gov/overdosefreegeneration>.

References:

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