

Xylazine Basics: Overdose Prevention, Harm Reduction, and Wound Care

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INTRODUCTION: This document provides information on xylazine, a non-opioid veterinary tranquilizer used as an additive in illicit drug supplies, notably in combination with heroin and fentanyl. It discusses the effects of xylazine use, including sedation and potential risks such as hypotension and bradycardia. The document also emphasizes harm reduction interventions for individuals who may encounter xylazine in the drug supply, including the use of naloxone for responding to overdoses and the importance of wound identification and treatment.

What Is Xylazine?

- Xylazine, also known as tranq or tranq-dope, is a non-opioid, unscheduled veterinary tranquilizer that is used as an additive in the illicit drug supply.^{1,2}
- Xylazine is a clonidine analog, meaning it has similar properties to the prescription-only medication clonidine, which lowers blood pressure and heart rate and can decrease anxiety.
- Xylazine was found to be unsafe in brief human clinical trials and is therefore not approved for use in humans.³
- In veterinary medicine, xylazine is used as a sedative, analgesic (pain reliever), and muscle relaxant for animals.
- Xylazine can be ingested orally, inhaled or sniffed, smoked, or injected.
- Xylazine is added to the drug supply because it is cheap and easy to obtain and because it enhances the sedative effect of other substances. Xylazine is most notably added to heroin and fentanyl-containing products, though it has also been reported in other drugs, including cocaine.
- Many people use xylazine inadvertently or unknowingly because it is added to other drugs.

Where Has Xylazine Been Found in the Drug Supply?

- It is believed that xylazine first emerged as an adulterant in Puerto Rico in the early 2000s and then moved to Philadelphia, PA, starting around 2016. In 2021, over 90 percent of fentanyl samples tested in Philadelphia contained xylazine.⁴
- The use of xylazine as an additive in the drug supply is now widespread along the Northeast and Mid-Atlantic corridor and is spreading across the United States. The largest increase between 2020 and 2021 in Drug Enforcement Administration drug seizures containing xylazine and in xylazine-positive overdose deaths occurred in the US South.
- In 2021, xylazine was found in tested drug samples in all four U.S. Census regions.⁵

What Are the Major Effects of Xylazine Use?

- Xylazine has a sedating effect. Sedation can be profound and last for several hours. Sedation from xylazine often outlasts the effects of the substances it is mixed with.
- Although sedation is the most commonly observed effect, xylazine may also cause hypotension (low blood pressure) and bradycardia (slowed heart rate).⁶
- In combination with other central nervous system depressants (most notably fentanyl, but also benzodiazepines and alcohol), xylazine use can potentiate, or increase, sedation and respiratory depression, increasing the risk for overdose.⁷
- Because of prolonged, significant sedation,

xylazine can cause nerve and muscle injuries as a result of people remaining in the same position over several hours.

- The use of xylazine has been associated with significant skin and soft tissue infections that are characterized by substantial tissue death (necrosis). The wounds are not necessarily associated with injection sites⁸ and may affect people who smoke or snort xylazine-containing drugs.⁹ The wounds most commonly occur on the extremities, particularly on the forearms and lower legs.

Responding to Overdose in Communities Where Xylazine Is Present

- As xylazine is often mixed with opioid drugs like heroin and fentanyl, people using those substances have the potential to experience both opioid overdose and prolonged and/or severe sedation due to the presence of xylazine.

It is important to note that any person who is suspected to be experiencing an overdose should have their respiratory and cardiac status assessed and should be administered naloxone and/or rescue breaths and chest compressions as appropriate and based on responder training. Call 911 and administer naloxone if a person is not breathing.

- Xylazine does not respond to naloxone, so a person who used an opioid and xylazine may remain sedated even after administration of

naloxone. It is important to assess respiratory status and look for the return of breathing after naloxone administration; a person who used both an opioid and xylazine may start breathing again but not fully regain consciousness. If a person is breathing again but remains sedated, place the person in a recovery position and await further help (paramedics). Do not administer more doses of naloxone once breathing has returned.

- For someone who is breathing but heavily sedated and has not responded to verbal cues, service providers in Philadelphia have developed a technique of splashing a small amount of cold or cool water on the person to wake them up. It is important to avoid getting any water near the nose or mouth of a person who is sedated.¹⁰

Xylazine Withdrawal

- Repeated and consistent xylazine use can lead to dependence, such that many people who begin to use xylazine inadvertently may end up seeking it out to prevent withdrawal. Withdrawal symptoms include anxiety, panic, and dysphoria (unease) and may include increased heart rate or blood pressure.
- People who are starting treatment for opioid use with medications such as buprenorphine or methadone may need additional support for xylazine withdrawal symptoms. This is also true for people who are receiving opioid withdrawal support or treatment in a hospital setting.
- In outpatient settings, people experiencing xylazine withdrawal will need support with managing anxiety. In inpatient settings, people may also receive cardiac monitoring for fluctuations in blood pressure or heart rate or to evaluate the impact of medications given to decrease withdrawal symptoms.¹¹

- If participants are aware of or believe that they have been using xylazine and need support during withdrawal, they should be encouraged to share that information with healthcare teams.

Xylazine-Related Wounds

- Wound identification and management are vital components of support for people who use xylazine.
- Participants who may encounter xylazine in the drug supply need education on the possibility of wound development, regardless of how they use it (smoking, snorting, or injecting) or where they inject it.
- Wounds most often appear on the forearms or lower legs and often begin as small, full-thickness (meaning they go through all the skin layers and into the fat and muscle layers below) circular lesions or, sometimes, as blisters on the skin. These lesions can quickly merge to form large, full-thickness wounds. These wounds tend to have a lot of necrotic (dead) tissue and drainage; they can appear with a dried black crust (eschar) and have an odor.
- Early and consistent wound care is important for managing xylazine-related wounds, which can be managed and healed in outpatient settings.
- Some people may benefit from surgical debridement (surgical removal of dead tissue) in an inpatient setting prior to outpatient management; this can be determined by a medical provider.
- Refer participants with wounds to primary care or medical outreach teams and encourage consistent engagement. People may need support with attending wound-care appointments or specialty visits.

- Participants should avoid injecting into the wounds (if possible), keep the wounds covered, and avoid picking and using harsh cleansers like peroxide, bleach, or alcohol. Following principles of infection control and basic wound care, such as washing hands and using gloves, using gentle cleansers like saline or water, and keeping wounds covered with a clean dressing makes a big difference.
 - If you are uncertain about a wound, cleanse the wound with normal saline or clean water; cover it with a non-adhesive or other clean, dry dressing; and refer the person to medical care. Do not use specialty dressings if you are unfamiliar with their intended use, because this can worsen wounds or cause damage to healthy tissue.
 - It is important to use a nonjudgmental approach and earn and foster trust, because a person may not disclose a wound due to embarrassment, concern for amputation, or fear of having to go into a hospital. Wounds can be healed regardless of a person's desire or ability to modify their substance use.
- blue or gray tinged lips or skin, or absence of breathing—and respond accordingly.¹²
 - As with other substances, people taking drugs containing xylazine should use with a companion. This helps prevent overdose but also theft and assault that can occur while a person is sedated.
 - Advise people to use in a comfortable position that will not cause injury if they are sedated for a prolonged period. Additionally, people should not use in a place where they could fall if sedated (e.g., a chair with no arms or the top step of a stoop).
 - The use of safe supplies like clean syringes and other equipment, as well as a good injection technique, is vital for preventing infectious disease transmission and other infections or abscesses.¹³
 - Monitor skin for signs of wounds or breakdown and seek help immediately if wounds start to develop. It is much easier to treat wounds when treatment starts early. Keep wounds covered with a clean dressing; do not leave the wound open to air or rely on a shirt sleeve for coverage.
 - Xylazine-related wounds can be healed. Prepare people for the catastrophizing that they might encounter in medical settings where healthcare providers are less familiar with xylazine wounds or harm reduction principles. Support regular medical care and decision-making around recommended interventions.
 - Use fentanyl and xylazine test strips where available.¹⁴

Harm-Reduction Interventions for Xylazine

- Harm-reduction approaches are essential for supporting people who are using xylazine. Harm reduction is an approach to care that meets people where they are, uses patient-centered goals as a starting place for collaborative action, and works to reduce harms related to substance use and other health behaviors.
- Naloxone remains an essential tool for responding to suspected overdoses, regardless of whether the person has also used xylazine. Assess for responsiveness and signs of respiratory distress—gurgling or gasping,





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Endnotes

- 1 Shobha Thangada, Heather A. Clinton, Sarah Ali, Jacqueline Nunez, James R. Gill, Robert F. Lawlor, and Susan B. Logan, “Notes from the Field: Xylazine, a Veterinary Tranquilizer, Identified as an Emerging Novel Substance in Drug Overdose Deaths—Connecticut, 2019–2020,” *Morbidity and Mortality Weekly Report* 70, no. 37 (2021): 1303–1304, <https://doi.org/10.15585/mmwr.mm7037a5>.
- 2 National Institute on Drug Abuse, “Xylazine,” accessed July 5, 2023, <https://nida.nih.gov/research-topics/xylazine>.
- 3 Drug Enforcement Administration, “Xylazine,” accessed July 5, 2023, https://www.deadiversion.usdoj.gov/drug_chem_info/Xylazine.pdf.
- 4 Philadelphia Department of Public Health, *Health Commissioner’s Office, Health Alert Risks of Xylazine Use and Withdrawal in People Who Use Drugs in Philadelphia* [Message #: PDPH-HAN-00377A-03-16-22], March 16, 2022, https://hip.phila.gov/document/2524/PDPH-HAN_Alert_1_Xylazine_03.16.2022.pdf/.



- 5 US Drug Enforcement Agency, *The Growing Threat of Xylazine and Its Mixture with Illicit Drugs: DEA Joint Intelligence Report*, December 21, 2022, <https://www.dea.gov/documents/2022/2022-12/2022-12-21/growing-threat-xylazine-and-its-mixture-illicit-drugs>.
- 6 National Institute on Drug Abuse, “Xylazine,” accessed July 5, 2023, <https://nida.nih.gov/research-topics/xylazine>.
- 7 Mbabasi Kariisa, Priyam Patel, Herschel Smith, and Jessica Bitting, “Notes from the Field: Xylazine Detection and Involvement in Drug Overdose Deaths—United States, 2019,” *Morbidity and Mortality Weekly Report* 70, no. 37 (2021): 1300–1302, <https://doi.org/10.15585/mmwr.mm7037a4>.
- 8 Srikrishna V. Malayala, Bhavani Nagendra Papudesi, Raymond Bobb, and Aliya Wimbush, “Xylazine-induced Skin Ulcers in a Person Who Injects Drugs in Philadelphia, Pennsylvania, USA,” *Cureus*, August 19, 2022, <https://doi.org/10.7759/cureus.28160>.
- 9 Philadelphia Department of Public Health, Health Commissioner’s Office, *Health Update: Xylazine (Tranq) Exposure among People Who Use Substances in Philadelphia* [Message #: PDPH-HAN-00417U-12-08-2022], December 8, 2022, https://hip.phila.gov/document/3154/PDPH-HAN_Update_13_Xylazine_12.08.2022.pdf/.
- 10 Hilary Disch, “Beyond Fentanyl: Tranq in the Supply,” *Prevention Point*, Accessed July 5, 2023, <https://ppponline.org/blog/beyond-fentanyl-tranq-supply>.
- 11 Philadelphia Department of Public Health, Health Commissioner’s Office, *Health Update: Xylazine (Tranq) Exposure among People Who Use Substances in Philadelphia* [Message #: PDPH-HAN-00417U-12-08-2022], December 8, 2022, https://hip.phila.gov/document/3154/PDPH-HAN_Update_13_Xylazine_12.08.2022.pdf/.
- 12 National Harm Reduction Coalition, “Responding to Opioid Overdose,” accessed July 5, 2023. <https://harmreduction.org/issues/overdose-prevention/overview/overdose-basics/responding-to-opioid-overdose/>.
- 13 National Harm Reduction Coalition, “Getting Off Right,” accessed July 5, 2023, <https://harmreduction.org/issues/safer-drug-use/injection-safety-manual/>.
- 14 Lev Facher, “Newly Available Test Strips Can Detect Lethal ‘tranq’ in Drug Supply,” *STAT* (blog), March 27, 2023, <https://www.statnews.com/2023/03/27/tranq-xylazine-test-strips-now-available/>.