U.S. Department of Justice
Drug Enforcement Administration

The Growing Threat of Xylazine and its Mixture with Illicit Drugs

DEA Joint Intelligence Report

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Executive Summary

Xylazine, reported as an adulterant in an increasing number of illicit drug mixtures, has also been detected in a growing number of overdose deaths. It is commonly encountered in combination with fentanyl but has also been detected in mixtures containing cocaine, heroin, and a variety of other drugs. However, xylazine is most frequently reported in combinations with two or more substances present. In addition to its presence in drug combinations, xylazine (often known as "tranq") is used on its own, though this is less frequently reported. Limited scientific research has been conducted on the effects of xylazine on the human body, but anecdotal reports indicate that users experience effects similar to opioids. Xylazine can lead to depression of the central nervous system along with other adverse effects, as reported in scientific and medical journals The presence of xylazine in illicit drug combinations and its detection in fatal overdoses may be more widespread than reported as a number of jurisdictions across the country may not include xylazine in forensic laboratory or toxicology testing.

Details

Xylazine is a non-opiate sedative, analgesic, and muscle relaxant only authorized in the United States for veterinary use according to the U.S. Food and Drug Administration. It is not currently a controlled substance under the U.S. Controlled Substances Act. Xylazine was first noted as an adulterant in Puerto Rico in the early 2000s through DEA reporting and laboratory analysis, and around a decade later it was documented on the island as a drug of abuse on its own, which has continued to present.

In licit sales for veterinary use, xylazine is available in liquid form and sold in vials or preloaded syringes. These solutions are prepared at a concentration appropriate for administration by injection based on the general size and weight of the species. It is legitimately sold directly through pharmaceutical distributors and Internet sites catering to veterinarians. However, xylazine is also readily available for purchase on other Internet sites in liquid and powder form, often with no association to the veterinary profession nor requirements to prove legitimate need. A kilogram of xylazine powder can be purchased online from Chinese suppliers with common prices ranging from $6-$20 U.S. dollars per kilogram. At this low price, its use as an adulterant may increase the profit for illicit drug traffickers, as its psychoactive effects allows them to reduce the amount of fentanyl or heroin used in a mixture. It may also attract customers looking for a longer high since xylazine is described as having many of the same effects for users as opioids, but with a longer-lasting effect than fentanyl alone. Some users intentionally seek out heroin or fentanyl mixed with xylazine, while many are completely unaware it is included as an adulterant. Conversely, there are also users who try to avoid opioids mixed with xylazine, stating that it reduces the euphoria experienced with heroin or a heroin-fentanyl mix or that they fear its added effects.

Drug Enforcement Administration (DEA) reporting indicates that the prevalence of xylazine is increasing, spreading beyond the traditional white-powder heroin markets in the northeastern United States where it has been seen for several years. Xylazine vials have been encountered at locations operating as local stash houses or in the homes of polydrug dealers, indicating that the mixture with other drugs happens at the retail level, though it cannot be determined how frequently. Most encounters of xylazine in the illicit drug supply are not identified at the time a seizure is made. In these cases, it is only detected through subsequent testing conducted by forensic laboratories.

Findings from DEA's laboratory system between 2020 and 2021 show instances of exhibits involving xylazine in all four U.S. census regions (see Figure 1). The Northeast has the highest total across the two-year period. Each of the four regions has seen an increase in identifications of xylazine. The South has the largest increase, reporting a 193 percent increase in xylazine instances, followed by the West with an almost 112 percent increase. DEA laboratory findings also indicate that xylazine was most commonly found in polydrug mixtures, often in mixtures containing fentanyl.

(U) Figure 1. DEA Forensic Laboratory Identifications of Xylazine by Region

Region	*2020*	*2021*	*Percent Increase*
Northeast	346	556	61%
South	198	580	193%
Midwest	110	118	7%
West	77	163	112%

Source: DEA

Adverse Effects and Overdoses

Reports from users are the main sources of information on the adverse effects of xylazine in humans since standard drug trials have not been conducted. Effects associated with xylazine use include dry mouth, drowsiness, hypertension, and tachycardia followed by hypotension and bradycardia, hyperglycemia, reduced heart rate, hypothermia, coma, respiratory depression, and dysrhythmia. Users who inject xylazine or drug mixtures with xylazine often develop soft tissue injuries that can lead to necrotic tissue and may result in amputation at rates higher than those who inject other drugs without xylazine. Additionally, users may develop a physical dependence to xylazine itself, with some users reporting the withdrawal symptoms from xylazine as, or more, severe than from heroin or methadone; symptoms include sharp chest pains and seizures.

When combined with fentanyl or other synthetic opioids, xylazine can increase the potential for fatal overdoses, as the similarity in pharmacological effects can further reduce the already

decreased respiratory function. Overdoses associated with xylazine may be more difficult to identify in clinical settings, as they often appear similar to opioid overdoses and may not be included in routine drug screening tests. Xylazine has no approved antidote for human use, and as xylazine is not an opioid, naloxone does not reverse its effects. Consequently the presence of xylazine may render naloxone less effective; however, the administration of naloxone can still address the effect of an opioid on breathing which may be sufficient to prevent death.

A comprehensive count of xylazine-positive[a] overdose deaths in the United States is not currently possible, as not all jurisdictions routinely conduct testing for xylazine in postmortem toxicology. Testing procedures can vary even within the same state. In addition, it is not currently included with the Centers for Disease Control and Prevention's (CDC) reporting of national statistics on fatal overdoses. As a result, it is very likely the prevalence of xylazine is widely underestimated. Despite this limitation, xylazine intoxication has been identified as a contributing factor to the cause of death in numerous fatal overdoses, usually in combination with fentanyl or other substances, although it has also been noted as the sole cause of death in an unknown number of fatalities.

Reporting from DEA's 23 domestic field divisions show that all four U.S. census regions have xylazine-positive fatal overdoses and have all experienced a significant jump from 2020 to 2021 (see Figure 2). These numbers may not represent every xylazine-positive overdose death, but at least account for a minimum of instances. It is unknown what percentage of the increase is due to expanded testing versus increasing use of xylazine. The Northeast has the highest total for the two-year period; the first appearances of xylazine in the continental United States were in this region, beginning sporadically in 2006, but steadily increasing since the mid-2010s. Xylazine use spread from there to the South and then on to the Midwest and West regions.

(U) Figure 2. Number of Xylazine-Positive Overdose Deaths by Region

Region	*2020*	*2021*	*Percent Increase*
Northeast	631	1,281	103%
South	116	1,423	1,127%
Midwest	57	351	516%
West	4	34	750%

Source: DEA

[a] *Xylazine-positive cases include any instances where its presence was detected in postmortem toxicology whether or not it was listed as contributing to the cause of death. Xylazine-involved cases only include fatal overdoses where xylazine was listed as a contributing factor in the cause of death; xylazine-involved cases are also xylazine-positive, but not all xylazine-positive cases are xylazine-involved cases.*

Outlook

The detection of xylazine in drug mixtures – particularly in combination with fentanyl – is increasing across the country. The fact that xylazine, a non-opioid, can cause respiratory depression similar to that of an opioid overdose may increase the potential for a fatal outcome at a time when overdose deaths in the United States continue to reach record highs. Treatment with naloxone will only counteract the effects of the opioid in a mixture, meaning the victim may require additional measures to survive. Responders may not be aware that xylazine intoxication is a factor and as a result may not know to apply additional life-saving methods when naloxone only partially reverses the symptoms.

The expanded use of xylazine as an adulterant may be driven in part by its low cost and lower risk of law enforcement scrutiny as it is not a controlled substance. Moreover, its addition to fentanyl can increase the profit for traffickers and attract additional customers. It is difficult to assess with certainty how widespread the use of xylazine is or the true number of xylazine-involved overdose deaths without expanded testing.

The emergence of xylazine across the United States appears to be following the same path as fentanyl, beginning with white powder heroin markets in the Northeast before spreading to the South, and then working its way into drug markets westward. This pattern indicates that use of xylazine as an adulterant will likely increase and be commonly encountered in the illicit fentanyl supply. Xylazine use throughout the United States may also follow the pattern seen in Puerto Rico and emerge as a drug of abuse on its own in the future, although it is unlikely to replace fentanyl or other opioids among illicit drug users.

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(U) This product was prepared by the DEA Intelligence Program – Field Support Section in coordination with the Strategic Intelligence Section. Comments and questions may be addressed to the DEA Indicator Programs Section at: DEA.IntelligenceProducts@dea.gov. For media/press inquiries call (571) 776-2508.

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