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Health Alert

Hazardous Industrial Chemical Detected in Philadelphia's Drug Supply

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Drug-related morbidity and mortality remains high in Philadelphia, where more than 1,400 individuals died from unintentional overdoses in 2022 and thousands more experienced non-fatal overdoses and adverse drug side effects. Complicating both the medical and public health response to this crisis is the widespread adulteration of the illicit drug supply. While the focus is often placed on new opioid analogues of known illicit substances, monitoring adulterants in the drug supply is equally as important.

SUMMARY POINTS

- bis(2,2,6,6-tetramethyl-4-piperidyl) sebacate, also known as BTMPS, has been detected in the Philadelphia drug supply in June, July, and August, 2024.
- BTMPS is an industrial chemical that is not intended for human use.
- There are no studies on the human use of BTMPS, and it is unclear what effect using BTMPS has on the human body.
- BTMPS has also been detected in the drug supply in other areas of Pennsylvania, North Carolina, Wisconsin, Maine, Oregon, Colorado, New York, Washington, Ohio, Michigan, California, New Mexico
- People who use drugs have described a chemical smell and taste – similar to bug spray, plastic, or adhesives.
- Some people who use drugs have described potential side effects as bloody cough, blurred vision, and ears ringing ears.

The Philadelphia Department of Public Health (PDPH) Surveillance Drug Checking Program has detected **bis(2,2,6,6-tetramethyl-4-piperidyl) sebacate**, also known as **BTMPS**, in Philadelphia's drug supply. BTMPS is an industrial chemical that is not approved for human use and is often used in plastics to block UV rays and listed as a component of fragrances and candles.[1,2] BTMPS was identified by Center for Forensic Science, Research, and Education (CFSRE) in seven drug samples submitted by PDPH during the time frame of 06/6/2024 and 7/9/2024. Samples containing BTMPS also contained fentanyl and xylazine, or a mixture of fentanyl, xylazine, and medetomidine. PDPH submitted a total of 46 samples during June and July 2024 where the primary drug detected was fentanyl. Based on samples submitted, BTMPS has been prevalent in 16% of June's samples and 11% of July's samples. **The number of samples tested is relatively low and we cannot be sure how widespread BTMPS is in Philadelphia's drug supply**. Of the 7 samples where BTMPS was detected, the levels of BTMPS varied widely – at times being present in trace amounts and other times being a large component of the sample. This is the first time BTMPS has been detected in illicit drugs being used in Philadelphia. It is unknown at this time if BTMPS has been involved in any fatal overdoses.

BTMPS has also been detected in North Carolina, Wisconsin, Maine, Oregon, Colorado, New York, Washington, Ohio, Michigan, California, New Mexico, and other areas of Pennsylvania.[1,3] The Opioid Data Lab at the University of North Carolina has summarized information on BTMPS from their national drug checking program, which includes standard Fourier transform infrared spectrometer spectra for use in point-of-care drug checking.[1] Reported sensations when smoked include ears ringing, vision blurred, bloody cough, and unusual taste (e.g., bug spray, plastic, adhesive), and reported sensations when injected include burning sensations.[1,4] A non-peer reviewed toxicology analysis of BTMPS detected in illicit fentanyl samples obtained in Los Angeles and Philadelphia has been published by researchers at the University of California, Los Angeles and the National

Institute of Standards and Technology.[4] Of the 66 samples obtained in Philadelphia, 26% contained BTMPS, which included 20% of samples obtained in August suggesting sustained presence in Philadelphia's drug supply. Quantitative analysis comparing samples with and without BTMPS showed that samples with BTMPS had lower fentanyl purity, which may impact the experience of people who use drugs.

Adverse Effects of BTMPS

BTMPS is considered a hazardous industrial chemical not intended for human use with possible fertility impairing effect.[2] Knowledge of the effects of BTMPS on the human body is based on experimental animal studies, which should be interpreted with caution regarding implications for human use. Studies using experimental animal model have demonstrated that BTMPS may have a cardiotoxic effect, which has been attributed to calcium channel blocking properties.[5,6,7,8] Experimental animal models have also demonstrated that BTMPS may inhibit nicotinic acetylcholine receptors.[9,10] There are no studies on the human use of BTMPS.

Overdose Response

It is not known at this time how BTMPS may impact the risk for overdose. Naloxone administration is the first step in responding to a drug overdose. If the individual is not breathing, then administer rescue breaths in between doses of naloxone. Once individuals are breathing on their own and taking a minimum of one breath every six seconds, they no longer require more naloxone. If the individual is still sedated, place them in the rescue position and continue to monitor their breathing. All overdose responses should include calling 911 so the individual can receive medical therapy.

Withdrawal Management

Experimental animal studies have demonstrated that BTMPS may decrease acute withdrawal symptoms. Again, there are no studies on the human use of BTMPS. All samples that tested positive for BTMPS also contained fentanyl, so withdrawal management should follow national guidelines and prioritize treatment of opioid withdrawal with methadone and buprenorphine. Almost all samples that tested positive for BTMPS in Philadelphia also contained xylazine and/or medetomidine. Withdrawal recommendations for those substances can be found here, here, and here, as well as in the peer-reviewed literature.[11,12]

Treat Substance Use Disorder (SUD)

SUD is a treatable chronic health condition. All clinicians registered with the Drug Enforcement Administration (DEA) can prescribe buprenorphine for the management of opioid use disorder and opioid withdrawal. In addition to buprenorphine, hospital-based clinicians can treat opioid use disorder and opioid withdrawal with Methadone. In the outpatient setting, clinicians can refer patients with opioid use disorder to an opioid treatment program for methadone initiation using the resources below. Patients with stimulant use disorder can benefit from behavioral therapies, such as contingency management, as well as from off-label medications following guidance from the American Society of Addiction Medicine and the American Academy of Addiction Psychiatry.

Prevent Initiation of Illicit Drug Use

Clinicians should be equipped with the skills and expertise to engage their patients in a respectful, trauma-informed, and patient-centered conversation about drug use. A guide in using non-stigmatizing language to talk about drug use can be found here. Early screening and successful treatment of psychiatric illness may prevent illicit drug use. Providers should also regularly screen for unhealthy drug use as part of routine care, and use the Prescription Drug Monitoring Program (PDMP) to inform their treatment plans. The PDMP should not be used punitively.

Prevent Harms Associated with Illicit Drug Use

For patients who have initiated illicit drug use, providers should be equipped with the skills and expertise to provide strategies to reduce the harm associated with drug use. These include:

- Always carrying Naloxone
    - Dispense naloxone directly to patients in your clinical setting.

  - See resources below for obtaining naloxone from PDPH.
- Testing drugs
  - There are test strips available to test drugs for the presence or absence of Fentanyl and Xylazine; However, there are currently no test strips available to test for Medetomidine or BTMPS.
  - See resources below for obtaining test strips from PDPH.
- Recommend patients to try not to use alone; if that is not possible, provide resources below.
- Recommend patients reduce the amount taken.

What is PDPH Doing:

- The Surveillance Drug Checking Program is testing illicit substances across clinical and community settings in Philadelphia to detect changes in the illicit drug supply.
- PDPH disseminates information about the drug supply to community partners who serve people who use drugs.
- The Division of Substance Use Prevention and Harm Reduction informs hospital-based clinicians of changes in the drug supply to inform and improve the care for people who use drugs in Philadelphia.
- The Medical Examiner's Office is updating the testing of overdose decedents to reflect the changing drug supply in Philadelphia.
- PDPH partners with DBHIDS, EMS, and other City agencies to share data and strategically support City-wide initiatives aimed at ending the overdose crisis and improving the lives of people who use drugs.
- PDPH distributes naloxone, fentanyl test strips, and xylazine test strips to community organizations and individuals across Philadelphia

Resources

Substance Use Disorder Treatment

- Division of Substance Use Prevention and Harm Reduction: https://www.substanceusephilly.com/treatment
- Behavioral Health Services Initiative (uninsured): 1-215-546-1200
- Community Behavioral Health (Medicaid): 1-888-545-2600
- CareConnect Warmline: 484-278-1679
- DBHIDS Medication Assisted Treatment: https://dbhids.org/services/addiction-services/mat/
- SAMHSA National Helpline: 800-662-HELP (4357)

Recommend patients try not to use alone. If that is what they are doing, then provide resources:

- Never Use Alone: 877-696-1996
- The Brave App – free to download on app stores
- Canary App – free to download on app stores

Learn how to get and use naloxone and fentanyl test strips

- https://www.substanceusephilly.com/get-supplies
- https://nextdistro.org/philly

Learn how to use fentanyl test strips:

- https://www.cdc.gov/stopoverdose/fentanyl/fentanyl-test-strips.html
- https://www.youtube.com/watch?v=GmhE6UOZ9YY

Take a wound care training

- https://www.substanceusephilly.com/healthcare-providers

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[2] Safety Data Sheet – Tinuvin® 770 DF. July 7, 2021. Accessed September 24, 2024. https://dispersions-resins-products.basf.us/products/tinuvin-770-df
[3] BTMPS (Monograph). The Center for Forensic Science Research & Education. September 3, 2024. Accessed September 23, 2024. https://www.cfsre.org/nps-discovery/monographs/bis2266-tetramethyl-4-piperidyl-sebacate
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[5] Sótonyi P, et al. "A light stabilizer Tinuvin 770-induced toxic injury of adult rat cardiac myocytes." Forensic science international 119.3 (2001): 322-327.
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[10] Graham JH, et al. "Functional central nicotinic acetylcholine receptor antagonism by systemic administration of Tinuvin 770 (BTMPS)." Current Alzheimer Research 2.2 (2005): 141-147.
[11] D'Orazio J, et al. "Xylazine adulteration of the heroin–fentanyl drug supply: A narrative review." *Annals of Internal Medicine* 176.10 (2023): 1370-1376.
[12] London K, et al. "Tranq dope: Characterization of an ED cohort treated with a novel opioid withdrawal protocol in the era of fentanyl/Xylazine." *The American Journal of Emergency Medicine* (2024).