Drug Checking — Quarterly Report

MID-ATLANTIC | **DRUG CHECKING** | **Q3 2025**

PURPOSE: This report provides up-to-date information regarding the drug supply and was developed in collaboration with organizations located in the Mid-Atlantic region of the United States, particularly in Philadelphia, Southeastern Pennsylvania, and surrounding areas.

OVERVIEW: Traditional drugs (e.g., fentanyl, cocaine, heroin, ketamine, and methamphetamine) are commonly identified among drug samples in cities across the United States, albeit at varying purities and in various combinations. Novel psychoactive substances (NPS) continue to appear within the drug supply, masked as traditional drugs or added to traditional drug preparations. Nationally, the drug supply remains a dynamic and evolving environment, with respect to the active drug components, cutting agents, and/or adulterants added to drug preparations. The drug supply and drug use trends can be different from city to city or even within a given community, requiring specific regional or local assessments. Accurate understanding of drug materials and the drug supply in real-time is imperative for effective public health and safety preparedness and response.

OBJECTIVE: Partnerships between the Center for Forensic Science Research and Education (CFSRE) and the Philadelphia Department of Public Health (PDPH) and Pennsylvania Groundhogs Group (PAG) were established to accurately assess the drug supply in the Mid-Atlantic region, epi-centered around Philadelphia, PA. Drug samples were collected by PDPH and PAG staff conducting field-based drug checking assessments and directed to the CFSRE for laboratory-based analysis. Many of PDPH samples are collected drug detritus, such as containers or glassine bags with residue. The CFSRE laboratory employs novel approaches for the analysis of drugs by comprehensive non-targeted data acquisition using gas chromatography mass spectrometry (GC-MS) and liquid chromatography quadrupole time-of-flight mass spectrometry (LC-QTOF-MS). The scope of testing contains more than 1,200 drug targets, including a great number of NPS and relevant substances. This initiative examines a variety of drug materials. *Note: The results reported herein represent a subset of the drug supply and do not represent the drug supply in its entirety.*

SUMMARY & NOTABLE FINDINGS

- **741** samples were tested from July 1 and September 30, 2025.
- Fentanyl adulteration shifts continued: Alpha-2 agonists were in favor of **medetomidine** over **xylazine**, and local anesthetics (e.g., **lidocaine**, **procaine**, **tetracaine**) increased in prevalence.
- Novel synthetic opioids market dynamics: **Nitazene analogues** were not detected in Q3 2025, while fentanyl analogues (e.g., **carfentanil**) were more common.
- **BTMPS** remained low, in 11% of tested fentanyl samples.
- NPS Benzodiazepines: **Bromazolam** (n=1), **Flubromazepam** (n=1) and **Phenazolam** (n=1) were detected [**Alprazolam** (n=5)].
- Synthetic cannabinoids: **5F-ADB** (n=4) was detected among K2 or Spice suspected samples.
- **Heroin** was detected in 28 (3.8%) samples.
- Four samples contained a trace **unknown substance** suspected to be a fentanyl-related, since identified as N-BOC norfentanyl.
- **Quantitative results** will appear in our Q4 Mid-Atlantic report, including fentanyl, medetomidine, xylazine, and more.

FIGURE 1: SAMPLES TESTED IN Q3 2025, CLASSIFIED BY THEIR PRIMARY DRUG SUBSTANCE

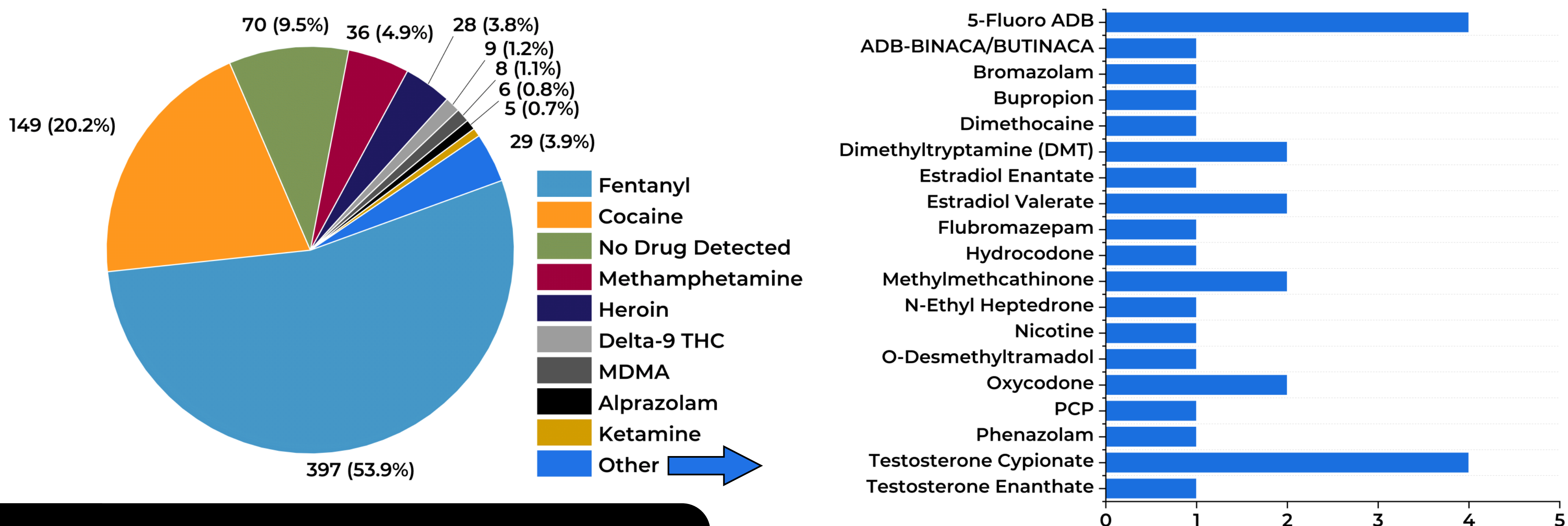

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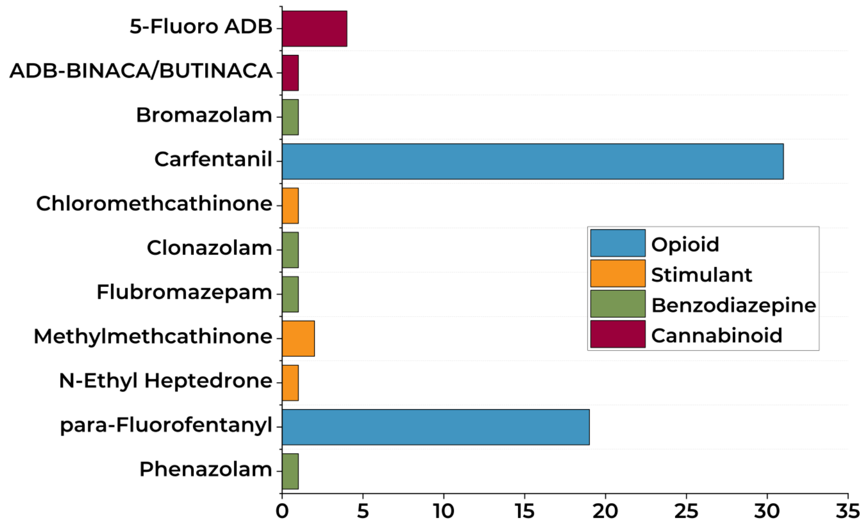
FIGURE 2: NPS DETECTED IN Q3 2025



IDENTIFICATIONS: Qualitative results indicate a drug is detected in a sample. Figure 1 (Page 1) shows the qualitative results for samples categorized by their primary drug, defined as the most abundant drug substance detected by gas chromatography-mass spectrometry (GC-MS). Major substances are summarized in the pie chart (Figure 1, left), while "other" substances (a category comprising less frequently observed substances) are expanded by counts in the bar chart (Figure 1, right). Of important note, the "primary drug" is defined as a traditional drug (e.g., fentanyl, methamphetamine, cocaine), pharmaceutical drug, or NPS; for samples in which the most abundant substance is as an adulterant or cutting agent, the primary drug is not most abundant substance.

Figure 2 shows qualitative data for NPS detected in tested samples during the referenced quarter in the Mid-Atlantic region. The numbers represent the totality of substances encountered during our GC-MS analysis, and some observations may represent a very minor component of the sample (e.g., trace carfentanil in a 10% fentanyl sample). Interestingly, among novel synthetic opioids, the trend of decreasing observations of **nitazene analogues** [none were observed] and increasing observations of **carfentanil** [n = 31] continued in Q3 2025. Our comprehensive analysis includes analysis by liquid chromatography–quadrupole time-of-flight mass spectrometry (LC-QTOF-MS), which can detect much lower amounts of substances such as carfentanil.

The drug supply in the Mid-Atlantic region remains diverse as a variety of substances were detected during this reporting period. There were more than twenty traditional drugs and adulterants detected, eleven NPS detected, and several fentanyl-related substances. The magnitude of identifications reported herein closely align with the CFSRE's toxicology datasets and **NPS Discovery Quarterly Trend Reports**.

COMBINATION ANALYSIS: Polysubstance (or polydrug) use is a term used to describe the consumption of more than one substance simultaneously or sequentially, sometimes with an implication that the person intentionally used separate substances. Examples include speedballs (e.g., cocaine and heroin), tranq dope (e.g., xylazine and fentanyl), and benzo dope (e.g., bromazolam and fentanyl). In samples containing synthetic opioids, it is common for samples to contain one or more pharmacologically active adulterants. In the Mid-Atlantic region, the primary alpha-2 agonist adulterant of choice has shifted from xylazine to medetomidine, while the amount of xylazine per positive sample has also declined drastically.

As shown in Figure 3 (Page 3), tested samples containing primarily methamphetamine were infrequently adulterated. Although not shown, the situation is similar for samples primarily containing MDMA, ketamine, and alprazolam. Samples containing primarily cocaine were occasionally (26%) adulterated with lidocaine. Samples containing primarily fentanyl were most commonly found adulterated, and regularly contained medetomidine (79%) and one or more local anesthetics: lidocaine (50%), procaine (62%), or tetracaine (48%). Less frequently detected adulterants included caffeine (a consistent finding in the Mid-Atlantic region) and xylazine (showing a uptick to 28% this quarter from a multi-year low in Q2). The samples classified as primarily heroin this quarter were less frequently observed with medetomidine or local anesthetics than fentanyl, but interestingly were found to have a higher rate of observation of the substance BTMPS, which remains an adulterant of ambiguous nature found in opioid samples since 2024. BTMPS has been more commonly associated with fentanyl-containing samples.

Looking at Figures 3 and 4 (Page 3), significant changes among the Mid-Atlantic region's drug supply have been observed since early 2024. The positivity of xylazine in fentanyl positive samples has declined dramatically, while the more potent alpha-2 agonist medetomidine is continuing to increase. From Q1 2024 to Q3 2025, the proportion of fentanyl samples testing positive for xylazine has decreased from 97% to only 28%. From Q1 2024 to Q3 2025, the proportion of fentanyl samples testing positive for medetomidine increased from negligible to 79%.

Increasing adulteration with local anesthetics continue to be observed in fentanyl samples collected in the Mid-Atlantic region. From Q1 2024 to Q3 2025, the proportion of fentanyl samples testing positive for lidocaine increased from 10% to 50%. Over that same time period, the proportion of fentanyl samples testing positive for procaine increased from negligible to 62%. Likewise, the proportion of fentanyl samples testing positive for tetracaine increased from negligible to 48%.

Cocaine was often not adulterated. When it was, the common adulterants included caffeine or lidocaine. Levamisole, the primary cocaine adulterant of the past, was virtually undetected in Mid-Atlantic drug samples in Q3 2025. For the other minor adulterants that were correlated to cocaine samples, these substances were found in samples that were also positive for fentanyl. *IMPORTANT NOTE:* Some "cocaine adulterated with fentanyl" samples may have been sold as fentanyl and the cocaine is present as the adulterant, despite cocaine being the more abundant "drug" substance. Classifying samples based on the chemical analysis alone remains a challenge.

As our laboratory wraps up quantitative testing on drug materials received during the 2025 calendar year, we look ahead to our next report (Q4 2025) with plans to incorporate the quantitative results for various drugs (e.g., fentanyl, methamphetamine, cocaine) and adulterants (e.g., lidocaine, medetomidine, xylazine).

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FIGURE 3: COOCCURRENCE OF (Y) BY PRIMARY DRUG (X)

	Cocaine	Fentanyl	Heroin	Meth
Acetaminophen	1%	4%	3%	0%
Benzocaine	0%	2%	0%	0%
BTMPS (Tinuvin 770)	1%	11%	21%	3%
Caffeine	12%	32%	10%	8%
Carfentanil	0%	8%	0%	0%
Cocaine	100%	32%	21%	17%
Diphenhydramine	0%	2%	0%	0%
Fentanyl	5%	100%	55%	17%
Heroin	0%	6%	100%	0%
Ketamine	0%	1%	0%	14%
Levamisole	1%	0%	0%	0%
Lidocaine	26%	50%	31%	14%
Medetomidine	5%	79%	7%	17%
Methamphetamine	2%	5%	7%	100%
para-Fluorofentanyl	0%	5%	0%	0%
Phenacetin	3%	3%	0%	0%
Procaine	6%	62%	31%	6%
Quinine	0%	1%	3%	0%
Tetracaine	3%	48%	0%	3%
Xylazine	1%	28%	3%	6%

Color scale: 0%, 10%, 20%, 30%, 40%, 50%, 60%, 70%, 80%, 90%, 100%

FIGURE 4: COOCCURRENCE OF (Y) IN FENTANYL OVER TIME

	2024 - Q1	2024 - Q2	2024 - Q3	2024 - Q4	2025 - Q1	2025 - Q2	2025 - Q3
Acetaminophen	3%	1%	4%	6%	4%	4%	4%
Benzocaine	17%	3%	4%	3%	10%	15%	2%
BTMPS (Tinuvin 770)	0%	4%	17%	46%	44%	11%	11%
Caffeine	10%	19%	22%	23%	24%	20%	32%
Carfentanil	3%	0%	0%	1%	3%	2%	8%
Cocaine	10%	11%	12%	2%	11%	5%	32%
Diphenhydramine	2%	6%	11%	2%	4%	0%	2%
Heroin	7%	6%	6%	7%	8%	6%	6%
Ketamine	0%	0%	1%	3%	1%	0%	1%
Lidocaine	10%	27%	48%	70%	50%	45%	50%
Medetomidine	0%	23%	49%	70%	68%	84%	79%
Methamphetamine	2%	4%	11%	0%	0%	1%	5%
para-Fluorofentanyl	12%	19%	13%	14%	6%	2%	5%
Phenacetin	2%	0%	1%	1%	1%	0%	3%
Procaine	3%	8%	17%	45%	49%	57%	62%
Quinine	0%	0%	1%	1%	0%	0%	1%
Tetracaine	0%	22%	37%	53%	56%	40%	48%
Xylazine	97%	92%	58%	49%	35%	10%	28%

Color scale: 0%, 10%, 20%, 30%, 40%, 50%, 60%, 70%, 80%, 90%, 100%

NOTES: *Figure 3 and 4: Selected [major] co-occurring analytes shown. Figure 4: Analysis includes only samples where fentanyl is the primary drug.*

DISCLAIMER: *There are limitations to the data presented. The dataset is not representative of the entirety of the Mid-Atlantic drug supply. Samples were not selected at random.*