

Fentanyl, Benzodiazepine and Xylazine Test Strips

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Known Limitations



Brand-to-brand variability

Lot-to-lot variability

Some strips are resold under a different brand name

Few independent validation/verification studies

Interpretation of the bands can be confusing

May not include drug checking instructions

Confusing instructions on what can be tested and dilutions

No quality assurance programs (yet)

Lieberman M, Badea A, Desnoyers C, Hayes K, Park JN. An urgent need for community lot testing of lateral flow fentanyl test strips marketed for harm reduction in Northern America. Harm Reduct J. 2024 Jun 15;21(1):115.

Halifax JC, Lim L, Ciccarone D, Lynch KL. Testing the test strips: laboratory performance of fentanyl test strips. Harm Reduction Journal. 2024 Jan 18;21(1):14.

Latest in Fentanyl Test Strip Studies

Halifax and colleagues (2024) found that:

BTNX FTS exhibits lot-to-lot variability in its ability to detect small amounts of fentanyl (10-100 ng/mL) and fentanyl analogs, including carfentanil (200-5000 ng/mL)

...there is lot-to-lot variability in whether interference from diphenhydramine, lidocaine, MDMA and methamphetamine would trigger a false positive.

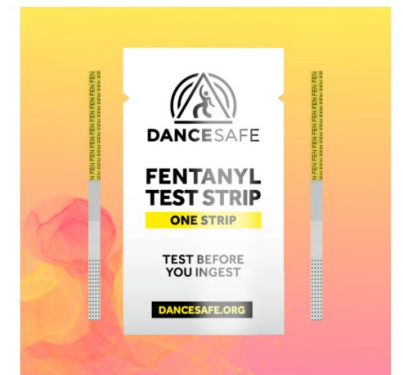
Halifax JC, Lim L, Ciccarone D, Lynch KL. Testing the test strips: laboratory performance of fentanyl test strips. Harm Reduction Journal. 2024 Jan 18;21(1):14.

Hayes & Lieberman (2023):

Tested 251 synthetic opioids—including 214 fentanyl analogs—using two brands of FTS.

They found that although 50 of them were not detected by either brand, 80 could be detected if both brands were used.

Hayes KL, Lieberman M. Assessment of two brands of fentanyl test strips with 251 synthetic opioids reveals "blind spots" in detection capabilities. Harm Reduct J. 2023 Dec 6;20(1):175.



Latest in Benzodiazepine Test Strip Studies

Crepeault and colleagues (2025)
found that:

- (1) BTNX test strips were able to detect benzodiazepine 67 % of the time;
- (2) False positives occurred 18% of the time.



Crepeault H, Tobias S, Angelucci J, Dubland S, Lysyshyn M, Wood E, Ti L. Detection of benzodiazepines in the unregulated drug supply using point of care and confirmatory drug checking technologies: A validation study. Drug and Alcohol Dependence. 2025 Jun 1;271:112631.

Latest in Xylazine Test Strip Studies

Scott et al., 2025 tested 7 brands and found:

- They worked! As long as the xylazine concentration was at least 750-2000 ng/mL
 - 2000 nanogram = 2 micrograms = 1/30th of a grain of table salt
 - 1 mL = one third of a 3mL intramuscular naloxone syringe
- They didn't perform as well as advertised but are still useful for screening purposes
- Waiting time of 2 minutes was as advertised
- Worked in extreme temperatures (25°F – 131°F)
- Detection levels were comparable to other studies/brands (CFSRE, 2022; CFSRE 2023; UND 2024; NIST 2024) but note that if the antibody changes, we need new studies!

Scott L, Davis K, Park JN, Majeed S. Evaluating the Sensitivity, Selectivity, and Cross-Reactivity of Lateral Flow Immunoassay Xylazine Test Strips. J Appl Lab Med. 2025 Apr 4;jfaf037. doi: 10.1093/jalm/jfaf037.

Figure: <https://filtermag.org/xylazine-test-strips-accuracy/>

	Lidocaine	Levamisole	Diphenhydramine*	Ketamine	Promethazine	Cetirizine**	Meth
BTNX							
DanceSafe							
WiseBatch							
MD-Bio							
12 PanelNow							
WaiveDX							
Medimpex							

FALSE POSITIVE

POSSIBLE FALSE POSITIVE

* Benadryl ** Zyrtec

Table by Sydney Sauer, based on the study findings. “False positive” means that a false positive was produced at least once, out of several tests—but not necessarily every time.

What should we make of the data?

Q: Which brands should we go with?

A: Brands that have been independently verified and that have been used by other drug checking programs. But always keep the limitations in mind!

Q: Which test strips should we distribute?

A: Ask PWUD on what they are concerned about. Scan drug trends from local drug checking, surveillance and overdose death data. Check cross-reactivity of existing brands with drug trends to minimize false positives/negatives.

Continue advocating for comprehensive drug checking services in your area!

Thank you!

ACDC

Saman Majeed lab

CUTS team

Community partners and participants

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