

## Performance assessment: Nitazene test strips

The purpose of this resource is to share results from a performance assessment conducted by [Ontario's Drug Checking Community](#) of nitazene test strips available for sale and marketed for harm reduction in Canada by [BTNX](#) and [Trimedic](#).

This performance assessment used samples of drugs collected from the unregulated (or “street”) drug supply and followed practices used by community agencies to check drugs using test strips.

### Summary of our findings

- BTNX and Trimedic nitazene test strips **reported the correct result 72% and 33% of the time, respectively**
- BTNX and Trimedic nitazene test strips **successfully detected three nitazene opioids circulating in Ontario's unregulated drug supply** when this performance assessment was conducted: [metonitazene](#), [metonitazepyne](#), and [protodesnitazene](#)
- **BTNX nitazene test strips often reported a very faint negative line for samples that did and did not contain nitazene opioids** – this made it very challenging to interpret results and impacted the simplicity of checking drugs with test strips
- **The effectiveness of BTNX and, specifically, Trimedic nitazene test strips for detecting various nitazene opioids in the trace amounts that are circulating in Ontario's unregulated drug supply currently is limited**

### Our motivation

In Canada, when test strips are used to check drugs, they are considered [consumer products](#), meaning they are not assessed by Health Canada to determine their safety, effectiveness, or quality prior to being authorized for sale. This is in contrast to test strips used to check urine, which are considered [medical](#)

[devices](#), and are assessed by Health Canada. In the absence of any regulation of tools and technologies used for community-based drug checking, our public health and safety program assesses and publicly shares information on their performance as part of our commitment to:

- Ensuring service user safety
- Supporting community agencies to deliver the best possible drug checking service
- Accurate monitoring of the unregulated drug supply and education on drug market trends
- Addressing inequities experienced by people who use drugs in our health and social systems

At this time, there is no perfect drug checking tool or technology:

- All have limitations, particularly when it comes to checking drugs most likely to contribute to overdose and related harms (i.e., those bought or got as unregulated opioids)
- All have trade-offs in terms of ease of use, quality of results, turnaround times for results, and cost

**What is most important is that service providers understand that all drug checking tools and technologies have limitations, understand what the limitations of the tools and technologies they use are, and can clearly communicate those limitations to service users.**

## Our process

This performance assessment included:

- 100 [BTNX nitazene test strips](#) (product code NTZ-18S26)
- 100 [Trimedec nitazene test strips](#)
- 100 samples of unregulated (or “street”) drugs that had already been checked as part of our provincial public health and safety program using mass spectrometry technologies

The BTNX and Trimedec test strips had a cut-off concentration of 2,000 ng and 300 ng of isotonitazene, respectively/1 mL of water, which implies they should be able to detect specified nitazene opioids in incredibly trace amounts.

The 100 samples of unregulated drugs were collected from people who use drugs (i.e., service users) in Toronto, Kingston, or Peterborough between January and August 2025 by [our collection site members](#). Collected samples were analyzed by our analysis site members (the clinical laboratory at the [Centre for Addiction and Mental Health](#) or [St. Michael’s Hospital](#)) using [gold standard technologies that are validated for overdose prevention drug checking](#), including gas chromatography- or high-resolution liquid chromatography-mass spectrometry.

Mass spectrometry results are considered the “reference result,” which test strip results were compared to. Of the 100 samples selected by our team for inclusion in this performance assessment, 75 contained nitazene opioids and 25 did not (as per the reference result).

Samples had been turned into solutions with a concentration of 10 mg of drug/1 mL of methanol for mass spectrometry analysis. As a first step in preparing samples for this performance assessment, we evaporated the methanol, returning each sample to a powder. Following the instructions provided by BTNX and Trimedica, we again turned each sample into a solution with a concentration of approximately 1 mg of drug/1 mL of water (equivalent to approximately 5 mg of drug/5 mL of water).

Both test strips were dipped into each solution, one at a time, allowing about 15 seconds for the solution to be absorbed by the strip. The strip was then removed from the solution and set aside on a flat clean surface to await results. Results for specified nitazene opioids were positive or negative. None of the test strips used reported an invalid result. Results were recorded and compared to the reference result. **BTNX nitazene test strips often reported a very faint negative line for samples that did and did not contain nitazene opioids.** This made it very challenging to interpret results and impacted the simplicity of checking drugs with test strips.

**Our findings**

|  | <b>BTNX nitazene test strips</b>                   | <b>Trimedica nitazene test strips</b>              |
|--|--|--|
| <b>Nitazene opioids detected<sup>1</sup></b>   | Metonitazene<br>Metonitazepyne<br>Protodesnitazene | Metonitazene<br>Metonitazepyne<br>Protodesnitazene |
| <b>Lowest amount of nitazene opioids detected that we quantified<sup>2</sup></b>   | n/a  | n/a  |
| <b>Sensitivity<sup>3</sup></b><br>How often the strips correctly reported a positive result (i.e., a true positive)        | 71%  | 11%  |
| <b>Specificity<sup>4</sup></b><br>How often the strips correctly reported a negative result (i.e., a true negative)        | 76%  | 100%   |
| <b>False negative rate<sup>5</sup></b><br>How often the strips incorrectly reported a positive result as a negative result | 29%  | 89%  |

|  |     |     |
|--|-----|-----|
| <b>False positive rate<sup>6</sup></b><br>How often the strips incorrectly reported a negative result as a positive result | 24% | 0%  |
| <b>Accuracy (or Correctness)</b><br>How often the test strip result matched the reference (i.e., mass spectrometry) result | 72% | 33% |

<sup>1</sup> Metonitazene, metonitazepyne, and protodesnitazene were the nitazene opioids found in the samples included in this performance assessment. Other research by our colleagues has confirmed the [BTNX nitazene test strips can detect additional nitazene opioids](#).

<sup>2</sup> Using high-resolution liquid chromatography-mass spectrometry, we often report the precise amount (or concentration) of certain drugs in the samples we check. We do not currently report this information for any nitazene opioids.

<sup>3</sup> The sensitivity of the BTNX and Trimedix nitazene test strips was impacted by false negatives for (i.e., missing) nitazene opioids in 22 and 67 samples included in this performance assessment, respectively. See note 5 to learn more.

<sup>4</sup> The specificity of the BTNX nitazene test strips was impacted by false positives for nitazene opioids in six samples included in this performance assessment. See note 6 to learn more.

<sup>5</sup> The BTNX nitazene test strips missed that nitazene opioids were present (i.e., reported a false negative) in 22 samples included in this performance assessment. The Trimedix test strips missed that nitazene opioids were present in those 22 samples, as well as in 45 additional samples (for a total of 67). The nitazene opioid present in all those samples was protodesnitazene. Both the BTNX and Trimedix strips successfully detected protodesnitazene in other samples. When protodesnitazene was missed, we assume it was below the cut-off concentration (i.e., limit of detection) for the strips. However, we cannot say for sure because we do not currently quantify protodesnitazene so could not confirm the amount of it in those samples. Understanding why the BTNX and Trimedix nitazene test strips missed nitazene opioids in those 22 and 67 samples, respectively, requires further research.

<sup>6</sup> In line with [existing research](#), six samples containing caffeine caused false positives for nitazene opioids by the BTNX strips. Using high-resolution liquid chromatography-mass spectrometry, we were able to determine precisely how much caffeine was in those samples. Caffeine accounted for between 11% and 34% of each of those six samples. However, caffeine was found in similar amounts in other samples and the BTNX strips

reported the correct result. Understanding those false positives reported by the BTNX strips requires further research.

## Learn more

Education is crucial for understanding when to use test strips, how to use test strips, and what test strip results mean. You may also be interested in other [resources on drug checking tools and technologies](#) developed by our program.

**We are committed to ensuring our public health and safety program adds value to the communities it serves. If you have any questions, comments, or feedback about this resource or our program, please contact [hello@drugchecking.community](mailto:hello@drugchecking.community).**

This performance assessment was undertaken by Meera Bissram, Dr. Sarah Delaney, Karen McDonald, Dr. Cristiana Stefan, and Hayley Thompson. This resource was reviewed by Jason Sereda and our colleagues at the Ontario Harm Reduction Distribution Program.

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**About Ontario's Drug Checking Community:** Ontario's Drug Checking Community is a national leader in drug checking service delivery and community-led unregulated drug market monitoring and education. This public health and safety program offers the most precise, timely, and accessible information on the unregulated drug supply to reduce harm and inform evidence-based responses to the worsening toxic opioid supply crisis.

Our program is comprised of a group of members, including collection sites, analysis sites, and a small central team that operates from within St. Michael's Hospital in Toronto.

**Our work would not be possible if people who use drugs did not donate their drugs to our program in an effort to reduce the harms associated with using unregulated substances and facilitate community-led drug market monitoring and education.**

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