

Fentanyl test strips

Drug checking aims to reduce the harms associated with using substances from the unregulated supply by offering people information on the contents of their drugs. Since 2018, drug checking has gained traction in Canada in response to the toxic drug supply crisis – specifically, as a measure to prevent opioid overdose, which [claims the lives of approximately 22 Canadians each day](#).

A variety of tools and technologies ranging from simple (e.g., test strips) to complex (e.g., mass spectrometry) are used to determine the composition of drugs. It is important to remember that drug checking as a response to the toxic drug supply crisis is in its infancy. Incredibly sophisticated and sensitive technologies continue to be required to effectively check highly contaminated opioids that are most likely to contribute to overdose. **At this time, there is no perfect drug checking technology or model: all have trade-offs in terms of quality of results, turnaround times for results, and cost.**

What are fentanyl test strips and how do they work?

Fentanyl test strips are a low-cost and simple drug checking tool that allow people to test their drug to understand whether fentanyl (or some drugs related to fentanyl, known as fentanyl analogues) may be present. They produce what is known as a binary drug checking result: yes, fentanyl is or, no, fentanyl is not present.

To perform a fentanyl test strip test, you add a very small amount of your drug to a small amount of water and stir to create a solution. You dip the test strip into the solution and then wait a few minutes for the result to be reported. If your drug is positive for fentanyl, one red line will present on the strip. If your drug is negative for fentanyl, two red lines will present on the strip. The amount of water to add to your drug may differ depending on the type of drug you are checking. **It is extremely important to follow the test strip instructions very closely to ensure the best result.**

Where to purchase fentanyl test strips

The most commonly used fentanyl test strips in Canada are distributed by BTNX in Ontario ([the 20 ng/mL strips, product code FYL-1S48-100](#)). They cost about \$1 CAD each.

DanceSafe, which operates out of the United States, has recently [released a new fentanyl test strip](#), which is an alternative – and may be an improvement – to the BTNX strips. For non-profits and community health agencies buying in bulk, they are likely to cost less than \$1 CAD each.

How effective are fentanyl test strips?

Fentanyl test strips are generally considered to be reliable and effective at determining the presence of fentanyl, even in very trace amounts. A [validation study of BTNX's fentanyl test strips conducted in 2017 – 18 by the British Columbia Centre on Substance Use](#) found:

- 88% sensitivity (i.e., proportion of the time the strips correctly found fentanyl)
- 95% specificity (i.e., proportion of the time the strips correctly did not find fentanyl)
- 12% false negative rate (i.e., proportion of the time the strips missed that fentanyl was present)
- 5% false positive rate (i.e., proportion of the time the strips reported fentanyl was present when it wasn't)

However, fentanyl test strips do have limitations. For example:

- Some [research indicates BTNX's fentanyl test strips may produce false positives](#) when checking methamphetamine, MDMA, cocaine, or methadone
- Other [research indicates BTNX's fentanyl test strips may not be as effective as advertised at detecting trace amounts of fentanyl](#)

Important note related to regulations – or a lack there of – associated with test strips as a drug checking tool in Canada: Test strips that are designed to test biological specimens, like urine, are considered [medical devices](#) in Canada, which means they are assessed by Health Canada to determine their safety, effectiveness, and quality before being authorized for sale. **When test strips are used to check substances or residue on used drug equipment, they are considered [consumer products](#) and are not assessed by Health Canada to determine their safety, effectiveness, or quality before being authorized for sale. This makes it even more important to understand the limitations of test strips prior to using them.**

When do fentanyl test strips add value?

Unfortunately, fentanyl test strips on their own are of least value to those at highest risk of overdose. This is because those at highest risk of overdose are often choosing to use fentanyl. People who use fentanyl would benefit from knowing the exact fentanyl analogue that is present in their drug, as the strength of fentanyl analogues can vary significantly (e.g., carfentanil is approximately 100 times stronger than fentanyl), how much fentanyl is present in their drug to

inform dosing decisions, whether there are multiple fentanyl-related drugs in their drug. Fentanyl test strips cannot do these things.

Fentanyl tests strips are most valuable:

1. As an engagement tool, providing an opportunity to initiate harm reduction conversations and build deeper relationships with people who use drugs.
2. For people who do not want to use fentanyl. For example, people who use stimulants, psychedelics, heroin, unregulated Percocet, etc. Thankfully, it is very infrequent that Toronto's Drug Checking Service finds high-potency opioids, like fentanyl, in other drug types, like stimulants, psychedelics, or depressants (i.e., in less than 0.2% of non-opioid samples checked between October 2019 – May 2024). That said, it is always a good idea to check your drugs.
3. For checking fentanyl using more sophisticated drug checking technologies that cannot detect the presence of substances in trace amounts. For example, currently, the most commonly used onsite (i.e., point of care) drug checking technology for overdose prevention is the FTIR (Fourier transform infrared spectrometer). The **FTIR has what is known as a limit of detection of about 5 – 10%**. This means that any substances that occupy less than 5 – 10% of the sample will likely be missed by the instrument. **Toronto's Drug Checking Service has determined that the drugs most likely to contribute to overdose usually do occupy less than 5 – 10% of the sample checked** (fentanyl, carfentanil, benzodiazepine-related drugs, xylazine). To offset this limitation, those using FTIR couple it with test strips, which have a higher likelihood of picking up drugs in trace amounts. **We strongly encourage the use of fentanyl test strips in combination with emerging and innovative onsite drug checking technologies whose limitations are in the process of being determined and therefore currently unknown.**

When are exemptions from Canada's *Controlled Drugs and Substances Act* required to use test strips?

If staff from an organization are conducting fentanyl test strip tests or observing drug checking using fentanyl test strips, a **section 56 exemption** is required from Canada's *Controlled Drugs and Substances Act*. If test strips are simply being distributed and checking controlled substances is not being observed, an exemption is not required. If you are in need of a drug checking exemption, we can help – reach us at **hello@drugchecking.community**.

Test strips for determining the presence of other drugs

Test strips have been developed to identify a variety of drugs, more recently with a focus on drugs that tend to contaminate unregulated opioids and contribute to the risk of overdose, such as benzodiazepine-related drugs (**product code BZO-1S3-100**) and xylazine (**a veterinary tranquilizer that has presented in about 10% of the fentanyl samples checked by Toronto's Drug Checking**

[Service since September 2020](#)). As above, Health Canada does not assess these strips to determine their safety, effectiveness, or quality when they are being used to check substances or residue on used drug equipment.

Select resources on test strips and other drug checking technologies

- British Columbia Centre on Substance Use's [technical tools](#) and [technical reports](#)
- Substance: Vancouver Island Drug Checking Project's [fentanyl and benzo test strips resource](#)
- Toronto's Drug Checking Service's [resource to equip community-based organizations to make informed decisions about partnering with a for-profit drug checking venture or purchasing an onsite drug checking technology](#)
- Toronto's Drug Checking Service's [technologies overview resource](#)

We are here to help! We know drug checking can be confusing and overwhelming. We are learning too but are a resource for the community. You can reach us any time at hello@drugchecking.community.

About this resource: The purpose of this resource is to share what we know about fentanyl test strips.

About Toronto's Drug Checking Service: [Toronto's Drug Checking Service](#) is a free and anonymous community-based public health service that aims to reduce the harms associated with substance use and, specifically, to prevent overdose by offering people who use drugs timely and detailed information on the contents of their drugs. Beyond educating individual service users, results for all samples are combined and analyzed to perform unregulated drug market monitoring, then translated and [publicly disseminated every other week](#) to communicate unregulated drug market trends and drug education to those who cannot directly access the service, as well as to inform care for people who use drugs, advocacy, policy, and research.

Participating collection sites: Casey House | Parkdale Queen West Community Health Centre (Parkdale and Queen West sites) | Regent Park Community Health Centre | South Riverdale Community Health Centre (KeepSix and Moss Park sites) | Street Health | The Neighbourhood Group (Kensington Market Overdose Prevention Site) | The Works at Toronto Public Health | Toronto Shelter and Support Services (Seaton House Overdose Prevention Site)

Participating analysis sites: Centre for Addiction and Mental Health (Clinical Laboratory and Diagnostic Services) | St. Michael's Hospital (Department of Laboratory Medicine and Drug Checking Unit)

Toronto's Drug Checking Service is coordinated by a small central team that operates from within the Drug Checking Unit at St. Michael's Hospital. The central team is also responsible for conducting unregulated drug market monitoring and developing and disseminating relevant drug information.

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