BRITISH COLUMBIA CENTRE ON SUBSTANCE USE

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Final Report

Piloting medetomidine test strips in community drug checking services

JUNE 2026

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Land Acknowledgement

The British Columbia Centre on Substance Use would like to respectfully acknowledge that the land on which we work is the unceded territory of the Coast Salish Peoples, including the territories of the xʷməθkwəyəm (Musqueam), Sḵwxwú7mesh (Squamish), and səlílp ɬwətaɬ (Tsleil-Waututh) Nations.

We recognize that the ongoing criminalization, institutionalization, and discrimination experienced by people who use drugs disproportionately harms Indigenous peoples and that continuous efforts are needed to dismantle colonial systems of oppression. We are committed to the process of reconciliation with Indigenous peoples and recognize that it requires significant and ongoing changes to the health care system.

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Get Your Drugs Tested
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Background

In British Columbia (BC), Canada, the unregulated opioid supply continues to undergo its evolution with the introduction of veterinary tranquilizers.[1] Following the widespread proliferation of xylazine, medetomidine is the most recent tranquilizer to emerge, and has increased in detection in jurisdictions across Canada and the United States.[2-4] Reported to be 200 times more potent than xylazine,[5] medetomidine has been linked to a host of adverse health outcomes, including bradycardia, hallucinations, and prolonged sedation, increasing the risk of complex overdose when used in conjunction with opioids such as fentanyl.[1,6] In addition to these acute effects, medetomidine withdrawal has been reported to be severe and difficult to manage, often progressing rapidly and requiring critical care[7,8]

At community drug checking services in BC, Fourier-transform infrared spectroscopy (FTIR) and select immunoassay test strip technologies have been generally effective in determining the presence of potent compounds such as fentanyl and benzodiazepines.[9,10] However, medetomidine is rarely found by FTIR due its presence in concentrations below the detection limit (<5%), and cannot be detected by fentanyl or benzodiazepine test strips. Although medetomidine can be detected via confirmatory testing with more sensitive methods such as mass spectrometry, the use of fast, accurate, and accessible tools to determine its presence of at the point of care could help to mitigate risks of medetomidine-related harms to service users.

Medetomidine-specific test strips (MTS) are proposed to fill this gap, and are designed to detect medetomidine even when present at low concentrations.[11] In addition, the use of an effective MTS for expected-opioid samples could also provide more accurate estimates of medetomidine prevalence in the unregulated opioid supply than those derived from samples selected for confirmatory testing alone. However, there has been little research conducted on the use of MTS on real-world drug samples to validate their use at community drug checking services.[12]

Pilot aims

Given the lack of evidence on the real-world effectiveness of MTS in samples from BC's unregulated drug supply, we conducted a pilot project in collaboration with BCCSU-partnered community drug checking organizations, Health Canada Drug Analysis Service (DAS), and Substance (University of Victoria), to evaluate MTS manufactured by BTNX. This pilot aimed to:

1. Evaluate the diagnostic accuracy (sensitivity and specificity) of MTS to detect medetomidine in expected-opioid samples submitted to community drug checking sites
2. Assess the prevalence of medetomidine during the pilot period in BC and by health authority, provided MTS diagnostic accuracy was deemed sufficient upon evaluation
3. Examine the relationship between medetomidine presence and the prevalence of adverse events among opioid samples submitted during the pilot period

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Methods

Pilot design

All BCCSU-partnered community drug checking organizations were invited to participate in a two-week pilot of MTS. We obtained representation from at least one drug checking site within each health region (Fraser Health, Interior Health, Island Health, Northern Health, and Vancouver Coastal Health) to best assess the prevalence of medetomidine in BC.

All unregulated opioid samples submitted as "down" were eligible for testing with MTS. Down is a colloquial term that refers to a mixture of substances, usually containing caffeine, sugars (e.g., erythritol, xylitol), and unknown opioids, typically fentanyl and/or fentanyl analogs. To ensure enough test strips were available, all other types of samples were excluded, including those submitted as "raw" fentanyl, as they were expected to be undiluted, and not yet adulterated with other substances such as medetomidine. All MTS (Product code: MED-18S2, Lot #DOAB25060002) were provided by the manufacturer for the purposes of evaluating their efficacy on real-world samples.

Sample data was recorded in the BCCSU electronic database, Drug Checking BC. Data included components detected by FTIR, and test strip results for fentanyl, benzodiazepines, and medetomidine. Additional variables included whether samples were checked pre- or post-consumption, and self-reported adverse events (e.g., non-fatal overdose, prolonged sedation, hallucinations) linked to samples checked post-consumption.

Confirmatory testing was supported by Health Canada DAS, and Substance. Drug checking technicians were instructed to submit as many eligible samples as possible for confirmatory testing. This data was used to assess the diagnostic accuracy of MTS, and qNMR results were used to explore the validity of the advertised cut-off detection level (1000 ng/ml).[11]

Procedures

At the time of sample collection, service users were asked what drug they expected their sample to be. If the sample met the inclusion criteria, service users were informed about the pilot, noting that MTS were a new technology in the evaluation stage and part of a temporary project. It was also recorded if samples were being submitted pre- or post-consumption. If samples were submitted post-consumption, service users were asked whether it had been associated with any adverse events, and the type of event was recorded. Consent was then requested from service users to send leftover material (~10 mg) for confirmatory testing for the purposes of the pilot.

The sample was then analyzed using FTIR spectroscopy, and fentanyl and benzodiazepine strip tests were performed according to BCCSU standard operating procedures along with MTS.[13-15]

The manufacturer's instructed dilution ratio for MTS (5-10 mg sample material and 5 ml water)[11] was scaled to 1-2 mg and 1 ml water to allow the benzodiazepine test strip to be performed simultaneously without requiring additional sample from the service user. The sample was dissolved in water in a microcentrifuge tube, and agitated by vortex or manual shaking for 30 seconds. Both MTS and benzodiazepine test strips were then placed into the solution, ensuring that the strips were not submerged past the water line. The solution was absorbed for 10-15 seconds, after which the strips were removed from the solution, and placed on a flat surface to develop for 2 minutes before being examined under a bright light. If the MTS result initially appeared positive, the strip was allowed to develop for up to 5 minutes to ensure a reliable result. In accordance with manufacturer instructions, results were considered invalid after 10 minutes. If results were not interpreted within 10 minutes, testing was repeated with a new test strip.[11]

The presence of a pink control band on the test strip indicated that the testing procedure had been performed properly.[11] The presence of pink test band indicated a negative result, regardless of how faint the line presented. The absence of the test band indicated a positive result. Technicians recorded sample information and drug checking results into the BCCSU electronic database.[13] If the test band result produced a faint negative test band (known as a "ghost line"), technicians left a comment in the text-entry field in the database so further examination of possible cross-reacting substances could be conducted.

Analysis

Diagnostic accuracy of MTS

Samples saved for confirmatory analysis were sent to either Health Canada DAS or Substance at the University of Victoria. The technologies used to confirm the presence or absence of medetomidine by DAS included quantitative nuclear magnetic resonance (qNMR), gas chromatography-mass spectrometry (GCMS), and gas chromatography with flame ionization detection (GCFID).[16] When possible, qNMR was used to determine the concentration of medetomidine present. Confirmatory testing by Substance was performed with paper-spray mass spectrometry (PSMS).[17]

Sensitivity was calculated as the proportion of true positive MTS results among all samples found to contain medetomidine by confirmatory analysis. Specificity was calculated as the proportion of true negative MTS results among all samples confirmed not to contain medetomidine.

Prevalence of medetomidine

Given sufficient diagnostic accuracy of MTS (determined *a priori* ≥90%), we then used the proportion of MTS-positive samples to retrospectively estimate the prevalence of medetomidine overall in BC and by health authority region during the pilot period. Using the Rogan-Gladen

estimator, we corrected the crude estimation of medetomidine prevalence to adjust for potentially misclassified MTS results with the final calculation of sensitivity and specificity.[18]

Prevalence of adverse events

As the presence of novel adulterants in the unregulated opioid supply has been associated with various adverse events in BC,[19] we evaluated the relationship between adverse events and medetomidine detection, both with and without the co-occurrence of benzodiazepines. We first described the distribution of medetomidine detection stratified by benzodiazepine presence (yes vs. no), as determined by FTIR analysis or benzodiazepine test strip.

Lastly, we evaluated the subset of samples that were submitted for drug checking post-consumption and linked to any self-reported adverse event. A generalized estimating equation (GEE) Poisson regression model with a log link was used to estimate adjusted prevalence ratios (aPR) for prolonged sedation events when expected-down samples contained medetomidine and/or benzodiazepines. All samples contained fentanyl, and were categorized as also containing medetomidine, benzodiazepines, or both, with the reference group defined as only fentanyl. We accounted for clustering at the health authority level using an exchangeable correlation structure which allowed us to obtain robust standard errors and population-averaged estimates. The level for statistical significance was set at p <0.05. Due to small sample sizes and imprecise estimates for other adverse events, regression analyses were restricted to prolonged sedation events.

Results

Between November 17 and November 30, 2025, 14 of the 15 active BCCSU-partnered community drug checking organizations participated in the pilot, with representation across all five health authority regions. In total, 463 expected-down samples were tested with MTS, representing 95.1% of all down samples submitted for drug checking in that period.

These results are divided into three parts: 1) updated diagnostic accuracy of MTS 2) prevalence of medetomidine and 3) prevalence of adverse events.

Updated diagnostic accuracy

Of the samples tested with MTS, 387 (83.6%) were sent for confirmatory testing at Substance, or Health Canada DAS. MTS results stratified by medetomidine detection by confirmatory testing (yes vs. no) for this subset are provided in **Table 1**. Please see the **Appendix** for a breakdown of samples analyzed by each lab, stratified by MTS result.

Table 1. Expected-down samples tested with medetomidine test strips, stratified by confirmatory analysis results (n=387)

MTS result	Medetomidine detected by confirmatory analysis		Total
	Yes	No	
Positive	130	24	154
Negative	10	223	233

Confirmatory testing determined that MTS correctly detected medetomidine in 130 (84.4%) of the 154 MTS-positive samples submitted. The remaining 24 (15.6%) MTS-positive samples were determined to not contain medetomidine (false-positive). Of the 233 MTS-negative samples, confirmatory testing determined that 223 (95.7%) had correctly yielded negative results, and in the remaining 10 (4.3%), medetomidine was present and had been missed (false-negative). Based on these results, the updated diagnostic accuracy of MTS was calculated as 92.9% sensitivity and 90.3% specificity (see **Table 2**). The lowest concentration of medetomidine reported by qNMR was <1% w/w, equivalent to <0.01-0.02 mg/ml following the test strip protocol. We note that medetomidine had not been quantified by qNMR for any false-negative samples, thus inferences to validate the cut-off detection threshold could not be ascertained. See the **Appendix** for details of samples with medetomidine quantification information available.

Table 2. Summary of BTNX medetomidine test strip diagnostic accuracy

Sensitivity (%)	Specificity (%)
92.9	90.3

Prevalence of medetomidine

Of the 463 expected-down samples tested with MTS, 176 (38.0%) produced positive results (see **Table 3**). After adjusting for MTS sensitivity and specificity, the overall estimated prevalence of medetomidine in BC was 34.0%. Prevalence varied between health regions, which ranged from 15.0% in the Vancouver Coastal Health region to 51.1% in Fraser Health. We note that adjusted prevalence estimates for regions with smaller sample sizes (Northern Health, Island Health) should be interpreted with caution as they are subject to more variability.

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Table 3. Expected-down samples tested with medetomidine test strips between November 17, 2025 and November 30, 2025 in British Columbia by health authority region (N=463)

Health authority region	Total samples	MTS-positive samples	Medetomidine prevalence (%)	
			Preliminary	Adjusted
Fraser Health	138	72	52.2	51.1
Interior Health	109	44	40.4	36.9
Island Health[a]	30	15	50.0	48.4
Northern Health	19	8	42.1	38.9
Vancouver Coastal	167	37	22.2	15.0
Total	**463**	**176**	**38.0**	**34.0**

[a]Data reflects samples tested at the one BCCSU-partnered drug checking service in the region. Substance provides additional drug checking for other sites in the Island Health region that were not included in the pilot.

Prevalence of adverse events

Table 4 shows the distribution of expected-down samples containing medetomidine, stratified by benzodiazepine presence. Of the 463 samples included in the pilot, benzodiazepines were detected in 223 (48.2%), and medetomidine in 176 (38.0%). Both substances co-occurred in 106 samples (22.9%). Medetomidine was detected in 70 samples without benzodiazepines (15.1%), and benzodiazepines were detected without medetomidine in 117 samples (25.3%). Neither substance was detected in 170 samples (36.7%). We note that all samples contained fentanyl.

Table 4. Co-occurrence of medetomidine and benzodiazepines among expected-down samples tested with medetomidine test strips between November 17, 2025 and November 30, 2025 in British Columbia (N=463)

Medetomidine detected	Benzodiazepines detected		Total
	Yes	No	
Yes	106	70	176
No	117	170	287
Total	223	240	463

Table 5 summarizes self-reported adverse events associated with samples submitted post-consumption. Among the 463 expected-down samples included in the pilot, 249 (53.8%) were submitted post-consumption. Of these, 67 (26.9%) were associated with at least one adverse

event, with multiple adverse events permitted per sample. The most commonly reported adverse event was prolonged sedation (n=31), followed by non-fatal opioid toxicity (n=30), and fatal opioid toxicity (n=20).± Other self-reported adverse events included dizziness, nausea, or vomiting, agitation, confusion, and irregular heartbeat. No instances of seizures, chest tightness, hallucinations, or allergic reactions were reported.

Table 5. Counts of self-reported adverse events by service users of drug checking services in British Columbia, among expected-down samples submitted post-consumption between November 17, 2025 and November 30, 2025 (n=67)

Adverse event	Count[a]
Prolonged sedation (including drowsiness, blackout, and/or catatonia)	31
Non-fatal opioid toxicity (overdose)	30
Fatal opioid toxicity (overdose)	20
Dizziness, nausea, vomiting	11
Agitation (including anxiety and/or uncontrollable movements)	4
Confusion	3
Irregular heartbeat	2
Seizure	0
Chest tightness	0
Hallucinations (audio or visual)	0
Allergic reaction	0
Other (please specify)[b]	7

[a]More than one adverse event could be reported per sample
[b]Reported "other" adverse events that fit existing categories were recoded accordingly

Adjusted prevalence ratios for prolonged sedation by adulterant category are shown in **Table 6**. All samples contained fentanyl. Compared with samples that contained fentanyl only (reference), the adjusted prevalence ratio (aPR) for prolonged sedation was 1.44 (95% CI: 0.22-9.39) among samples containing benzodiazepines. Samples containing medetomidine had an aPR of 6.39 (95% CI: 1.44-28.2), and samples that contained both benzodiazepines and medetomidine had an aPR of 7.87 (95% CI: 1.95-31.7). Due to the small sample size and imprecise confidence intervals for other adverse events, prevalence ratios are reported only for prolonged sedation.

± We note that reported fatal opioid toxicity events may reflect misinterpretation of the question by service users, describing events related to a larger batch they believe the sample originated from, rather than the actual sample they submitted. These reports may also be explained by third-party drug checking, where the service user submits a sample on behalf of another person.

Table 6. Adjusted prevalence ratios for self-reported prolonged sedation by adulterant category calculated using GEE Poisson regression among expected-down samples checked post-consumption between November 17, 2025 and November 30, 2025 in British Columbia (n=31)

Adulterant present	Adjusted prevalence ratio	95% CI	*p*-value
Fentanyl only[a]	1.00	-	-
Benzodiazepines	1.44	0.22-9.39	0.70
Medetomidine	6.39	1.44-28.2	0.015*
Both benzodiazepines and medetomidine	7.87	1.95-31.7	0.003*

95% CI: Confidence interval
[a]All samples contained fentanyl
*Indicates significance at p <0.05 level

Discussion

This pilot is among the first to examine the use of MTS in real-world settings, and the first to evaluate their effectiveness within the context of the unregulated opioid supply in BC. One key strength of this pilot is that nearly all expected-down samples submitted for drug checking at BCCSU-partnered sites during the pilot period were tested with MTS, which allowed us to estimate the prevalence of medetomidine in BC. Additionally, as most samples were sent for confirmatory testing, we were able to obtain a robust measurement of sensitivity and specificity (92.9% and 90.3%, respectively). To account for imperfect diagnostic accuracy, we adjusted our estimation of medetomidine prevalence for potentially misclassified MTS results, and found that the overall prevalence of medetomidine among expected-down samples during the pilot period was 34.0%.

Our findings are also the first, to our knowledge, to demonstrate that medetomidine adulteration of unregulated opioids is associated with increased prevalence of prolonged sedation events, with the highest prevalence observed among samples containing both medetomidine and benzodiazepines. While prolonged sedation events have been documented among benzodiazepine-adulterated opioids prior to the widespread emergence of medetomidine,[18] the impacts of medetomidine, both alone and with benzodiazepines, have not yet been well-examined. These findings are consistent with first-hand reports from front-line harm reduction workers and people who use drugs in our network, and coincides with a spike in paramedic-attended drug toxicity events across BC that occurred in the months leading up to the pilot and continues to persist today.[20]

Importantly, we found that while more down samples contained benzodiazepines than medetomidine, medetomidine was more likely to be present with benzodiazepines rather than

by itself, indicating substantial co-occurrence in unregulated opioids. Characterizing the co-occurrence of medetomidine and benzodiazepines in unregulated opioid samples, along with their associated adverse effects, contributes to a growing understanding of the public health risks posed by this polysubstance combination. As evidence continues to emerge regarding the clinical implications of medetomidine use, including challenges related to severe withdrawal,[7,8] more investigation is needed to inform effective care and harm reduction strategies for individuals who use unregulated opioids that have been adulterated with medetomidine, both with and without benzodiazepines.

While we observed that MTS correctly detected medetomidine in a single sample at <1% concentration w/w, equivalent to <0.01-0.02 mg/ml following the test strip protocol, this was approximately 10 times higher than the manufacturer's advertised cut-off detection threshold (1000 ng/ml). Additionally, since medetomidine could not be quantified by qNMR in any of the samples that yielded false-negative results, and rather was detected by GCMS, we also could not ascertain whether these were true false-negatives or, if in these cases, medetomidine was present at levels below the test strip cut-off. As such, in this pilot, we were unable to validate the MTS cut-off detection threshold reported by the manufacturer. An evaluation conducted by Amate and Lieberman (2026), however, found that the same BTNX MTS (Product code: MED-18S2, Lot #DOAB25060002) reliably detected medetomidine at concentrations above 750 ng/ml.[21] The authors also found variability in performance depending on factors such as the type of water used to prepare samples (tap vs. deionized) and storage conditions prior to use (5°C vs. 38°C). This suggests that test strip performance can be affected by external factors that are not always known or controllable in real-world settings, such as storage and transport conditions.

We also note that we observed differences in performance compared to an evaluation conducted by Toronto's Drug Checking Service (2026), where BTNX MTS (Product code: MED-18S2) performed with high accuracy at 95% sensitivity and 100% specificity.[22] While sensitivity differed between our evaluations by 2%, there was nearly a 10% difference in specificity. Upon review of samples that produced false-positive results in this pilot, we did not identify any consistent patterns in sample composition known to cause interference, such as the presence of levamisole.[10] Potential reasons for the difference we observed could be related to the smaller sample size in the Toronto evaluation, or due to differences in study design. For example, the evaluation by Toronto's Drug Checking Service was conducted at a single centralized site, where testing procedures were likely more standardized. In contrast, our pilot was conducted across multiple community drug checking sites in BC, which may have introduced greater variability in testing conditions and procedures across technicians.

Limitations

There are several limitations to consider when interpreting these results. First, and as previously noted, we were unable to determine what substances could have produced the 24 false-positive MTS results observed, or whether these were attributable to user error. For example, technicians recorded faint negative test lines for several samples, which, consistent with other test strips, can be difficult to interpret without careful examination. Misclassification may therefore arise from both subjective interpretation and the limitations of the test strips themselves.

Second, the duration of the pilot period was short, and the composition of the unregulated opioid supply is known to vary over time. As such, the estimated prevalence of medetomidine is limited to the two-week period during which the data was collected, and may not reflect longer-term trends in BC. Additionally, these estimates may not be generalizable to the broader unregulated opioid supply, as samples submitted for drug checking may differ from those not tested. The short pilot period also limited the number of samples collected in some regions, and estimates from regions with smaller sample sizes should be interpreted with caution due to increased variability.

Finally, adverse events were self-reported and linked to individual samples rather than unique individuals, and multiple samples may have been submitted by the same person. As a result, observations may not be independent, and adverse event data may be subject to information biases. Furthermore, the experience of an adverse event may drive service users to submit their sample to a drug checking service. Overall, the number of samples linked to adverse events was limited, resulting in reduced statistical power and imprecise estimates. Future examination of with a larger sample size is needed to better characterize these associations.

Conclusion

This pilot demonstrates the feasibility of using medetomidine test strips at point-of-care drug checking settings, and provides early evidence of the proliferation of medetomidine in the unregulated opioid supply in BC. Our findings address a key knowledge gap pertaining to medetomidine prevalence and its frequent co-occurrence with benzodiazepines, with important implications for adverse health events such as prolonged sedation. By providing empirical evidence linking medetomidine detection to specific adverse events in real-world settings, this pilot contributes to a growing understanding of medetomidine-related harms. Characterizing these relationships will be essential for informing evidence-based harm reduction strategies, public health responses, and clinical awareness in the context of an evolving and increasingly complex drug supply.

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Recommendations

Upon preliminary analysis of pilot data in December 2025, elevated medetomidine prevalence levels were observed in many pilot communities. Accordingly, preliminary recommendations for MTS use in BC were provided to health authorities and their service delivery partners across the BCCSU network in January 2026 based on these findings. Subsequent, complete analysis has not significantly altered BCCSU's recommendation for medetomidine test strip use in BC.

Of note, the preliminary recommendations for MTS use in BC were accepted by BCCSU's health authority and service delivery partners, and were implemented across the BCCSU Drug Checking network. To support implementation, BCCSU has released a standard operating procedure for the use of MTS. BCCSU also began monthly reporting on the percentage of opioid samples testing positive for medetomidine both provincially and by health region in March 2026.

Recommendations are presented here complete in final form:

1. MTS should be implemented across all point-of-care drug checking services to be used alongside FTIR spectroscopy. As the unregulated opioid supply changes rapidly, we recommend the use of MTS as temporary tool that should be revaluated by health authorities on a 6-month or yearly basis.
    a. Health authorities may consider discontinuing MTS use in point-of-care services if medetomidine is no longer commonly detected in the unregulated opioid supply.

2. MTS should be performed on all opioid samples, including those submitted as fentanyl, “down,” heroin, and pharmaceutical opioids.
    a. Samples submitted as an “unknown” substance that test positive for fentanyl, or resemble down based on their composition should also be tested with MTS.

3. Non-opioid samples should only be tested with MTS when they meet certain criteria:
    a. The sample is expected to be medetomidine.
    b. Benzodiazepine tablets in which a benzodiazepine was not detected. Note that only one instance of this has been recorded at the time of publication.

4. For testing efficiency, MTS can be run concurrently with other BTNX test strips, as testing procedures are identical (e.g., benzodiazepine and fentanyl 2.0 strips).
    a. Sample material and water ratios used to prepare the testing solution can be scaled according to the procedure used for this pilot (2 mg sample into 1 ml water), to allow for multiple strips to be tested simultaneously with minimal sample material needed from service users.

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5. MTS results should continue to be recorded in the BCCSU electronic database.
    a. Faint negative results should be noted in the comments by technicians, and sent for secondary testing to allow for further investigation of possible cross-reacting substances.

6. At the time of writing, Toronto's Drug Checking Service indicated that BTNX was offering a discount on medetomidine test strips to address affordability concerns among community drug checking organizations. To inquire, please email harm.reduction@btnx.com, and reference discount code TDC-MED30.

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References

1. British Columbia Centre for Disease Control. Unregulated Drug Supply Substance Information Sheet: Medetomidine. 2024 Oct. https://www.bccdc.ca/resource-gallery/Documents/Harm%20Reduction/Medetomidine%20Substance%20Info%20Sheet.pdf
2. Palamar JJ, Krotulski AJ. Medetomidine infiltrates the US illicit opioid market. *Jama.* 2024 Nov 5;332(17):1425-6.
3. Toronto's Drug Checking Service. Unregulated fentanyl supply trends: Toronto, Ontario September 20 – October 3, 2025. 2025 Oct. https://drugchecking.community/wp-content/uploads/dlm_uploads/2025/10/Torontos-Drug-Checking-Service-report_Sep20-Oct3-2025.pdf
4. Canadian Community Epidemiology Network on Drug Use. Substance Use Trends in Canada: Medetomidine. 2024 Sep. https://www.ccsa.ca/sites/default/files/2024-11/CCENDU-Newsletter-Issue-2-en.pdf
5. Connell AR, Hookham MB, Fu D, Brazil DP, Lyons TJ, Yu JY. Comparisons of α2-adrenergic agents, medetomidine and xylazine, with pentobarbital for anesthesia: important pitfalls in diabetic and nondiabetic rats. *Journal of Ocular Pharmacology and Therapeutics.* 2022 Mar 1;38(2):156-66.
6. Sibley AL, Bedard ML, Tobias S, Chidgey BA, Phillips IG, Bell A, Dasgupta N. Emergence of Medetomidine in the Unregulated Drug Supply and Its Association With Hallucinogenic Effects. *Drug and Alcohol Review.* 2025 Aug 22.
7. Lynch MJ, Pizon AF, Yealy DM. Emergence of Medetomidine in the Illicit Drug Supply: Implications for Emergency Care and Withdrawal Management. *Annals of Emergency Medicine*. 2026 Jan.
8. Ostrowski SJ. Notes from the field: severe medetomidine withdrawal syndrome in patients using illegally manufactured opioids—Pittsburgh, Pennsylvania, October 2024–March 2025. MMWR. Morbidity and Mortality Weekly Report. 2025;74.
9. Shapiro AM, Sim D, Wu H, et al. Detection of etizolam, flualprazolam, and flubromazolam by benzodiazepine-specific lateral flow immunoassay test strips. 2020 Jul. https://drugcheckingbc.ca/wp-content/uploads/sites/4/2020/07/BenzoTestStrip_Report.pdf
10. McCrae K, Tobias S, Grant C, et al. Assessing the limit of detection of fourier-transform infrared spectroscopy and immunoassay strips for fentanyl in a real-world setting. *Drug Alcohol Rev.* 2020 Jan;39(1):98-102. Doi:10.1111/dar.13004

11. BTNX Inc. (Pickering, ON). Rapid Response Medetomidine Test Strip (Liquid/Powder). Product Insert. 2024 Sep. https://strategicstrike.blob.core.windows.net/lochness-products/resources/MED-18S2-10-IFU-EN-Product%20Insert-408.pdf
12. Sisco E, Ventura M, Shuda SA. Enantiomeric Determination of Medetomidine in Street Drug Samples (August 2024—February 2025) and Implications for Immunoassay Test Strip Analysis. *Drug Testing and Analysis.* 2025 Dec;17(12):2347-53.
13. British Columbia Centre on Substance Use. Drug checking operational technician manual (Version 2). 2022 Mar. https://drugcheckingbc.ca/wp-content/uploads/sites/4/2022/03/BCCSU_Technician_Manual_Version2.pdf
14. British Columbia Centre on Substance Use. *Using Benzo Test Strips for Drug Checking Step-by-Step Guide*. 2020 Apr. https://drugcheckingbc.ca/wp-content/uploads/sites/4/2020/05/Benzodiazepine-Test-Strip-Procedure.pdf
15. British Columbia Centre on Substance Use. *Fentanyl Test Strip Procedure*. 2020 Apr. https://drugcheckingbc.ca/wp-content/uploads/sites/4/2020/05/Fentanyl-Test-Strip-Instructions.pdf
16. Government of Canada. Health Canada Drug Analysis Service. https://www.canada.ca/en/health-canada/services/health-concerns/controlled-substances-precursor-chemicals/drug-analysis-service.html
17. Substance Drug Checking Program. University of Victoria. https://substance.uvic.ca/
18. Rogan WJ, Gladen B. Estimating prevalence from the results of a screening test. *American Journal of Epidemiology.* 1978 Jan 1;107(1):71-6.
19. Tobias S, Angelucci J, Wood E, Buxton JA, Ti L. Novel adulterants in unregulated opioids and their associations with adverse events. *Canadian Journal of Public Health.* 2025 Jun;116(3):356-63.
20. British Columbia Centre for Disease Control. BC warns of increase in drug poisonings, shifts in unregulated supply. 2026 Jan. https://www.bccdc.ca/about/news-stories/stories/2026/bc-drug-poisonings
21. Amate A, Lieberman M. Chiral sensitivity of medetomidine lateral flow immunoassay test strips. *Harm Reduction Journal*. 2026 Dec;23(1):19.
22. Toronto's Drug Checking Service. Performance assessment: Medetomidine test strips. 2026 Jan. https://drugchecking.community/resource/medetomidine-test-strips/

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Appendices

Supplementary Table 1. Community samples tested with medetomidine test strips between November 17, 2025 and November 30, 2025 by health authority in British Columbia (n=387)

Confirmatory testing laboratory	Total n=387	MTS result	
		Positive	Negative
Substance, University of Victoria	343	140	203
Health Canada Drug Analysis Service	44	14	30

Supplementary Table 2. Components of expected-down samples with medetomidine quantification information provided by Health Canada DAS

Sample components	Medetomidine concentration (%w/w) by qNMR
Fentanyl, para-Fluorofentanyl, Medetomidine, Caffeine, Erythritol	<1
Fentanyl, para-Fluorofentanyl, Medetomidine, Caffeine, Erythritol	1.68
Para-Fluorofentanyl, Erythritol, Medetomidine, Phenazolam, Caffeine	2.32
Fentanyl, para-Fluorofentanyl, Medetomidine, Caffeine, Erythritol, Fluoro 4-ANPP	2.96
Medetomidine, Caffeine, Erythritol, Fentanyl, para Fluorofentanyl	3.09
Para-Fluorofentanyl, Fentanyl, Medetomidine, Caffeine, Erythritol, Fluoro 4-ANPP	3.13